TM 11-5820-800-13&P

TECHNICAL MANUAL

OPERATOR'S AVIATION UNIT AND INTERMEDIATE MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

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RADIO SET AN/PRC-90

(NSN 5820-00-782-5308)

HEADQUARTERS, DEPARTMENT OF THE ARMY

5 MARCH 1985

Technical Manual

No. 11-5820-800-13&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 5 March 1985

OPERATOR'S AVIATION UNIT AND INTERMEDIATE MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) RADIO SET AN/PRC-90 (NSN 5820-00-782-5308)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, NJ 07703-5007. In either case, a reply will be furnished direct to you.

Page

CHAPTER 1. INTRODUCTION 1-1
Section I. General 1-1
II. Description and Data 1-2

*This manual supersedes TM 11-5820-800-12, 30 November 1973, including all changes.

CHAPTER 2.		SERVICE UPON RECEIPT AND INSTALLATION	2-1
Section I.		Service Upon Receipt of Materiel	2-1
	II.	Installation	2-4
CHAPTER 3.		OPERATING INSTRUCTIONS	3-1
Section I.		Controls and Instruments	3-1
	II.	Operation Under Usual Conditions	3-4
	III.	Operation Under Unusual Conditions	3-11
CHAPTER 4.		MAINTENANCE INSTRUCTIONS	4-1
Section I.		Tools and Equipment	4-1
	II.	Repainting and Refinishing	4-2
	III.	Preventive Maintenance Checks and Services	4-5
	IV.	Troubleshooting	4-10
	V.	Maintenance of AN/PRC-90	4-13
APPENDIX A.		REFERENCES	A-1
	B.	MAINTENANCE ALLOCATION	B-1
Section	I.	Introduction	B-1
	II.	Maintenance Allocation Chart	B-5
	III.	Tool and Test Equipment Requirements	B-6
	IV.	Remarks	B-8
	C.	ORGANIZATIONAL MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST	C-1
Section	I.	Introduction	C-1
	II.	Repair Parts List	C-5
	III.	Special Tools List	C-6

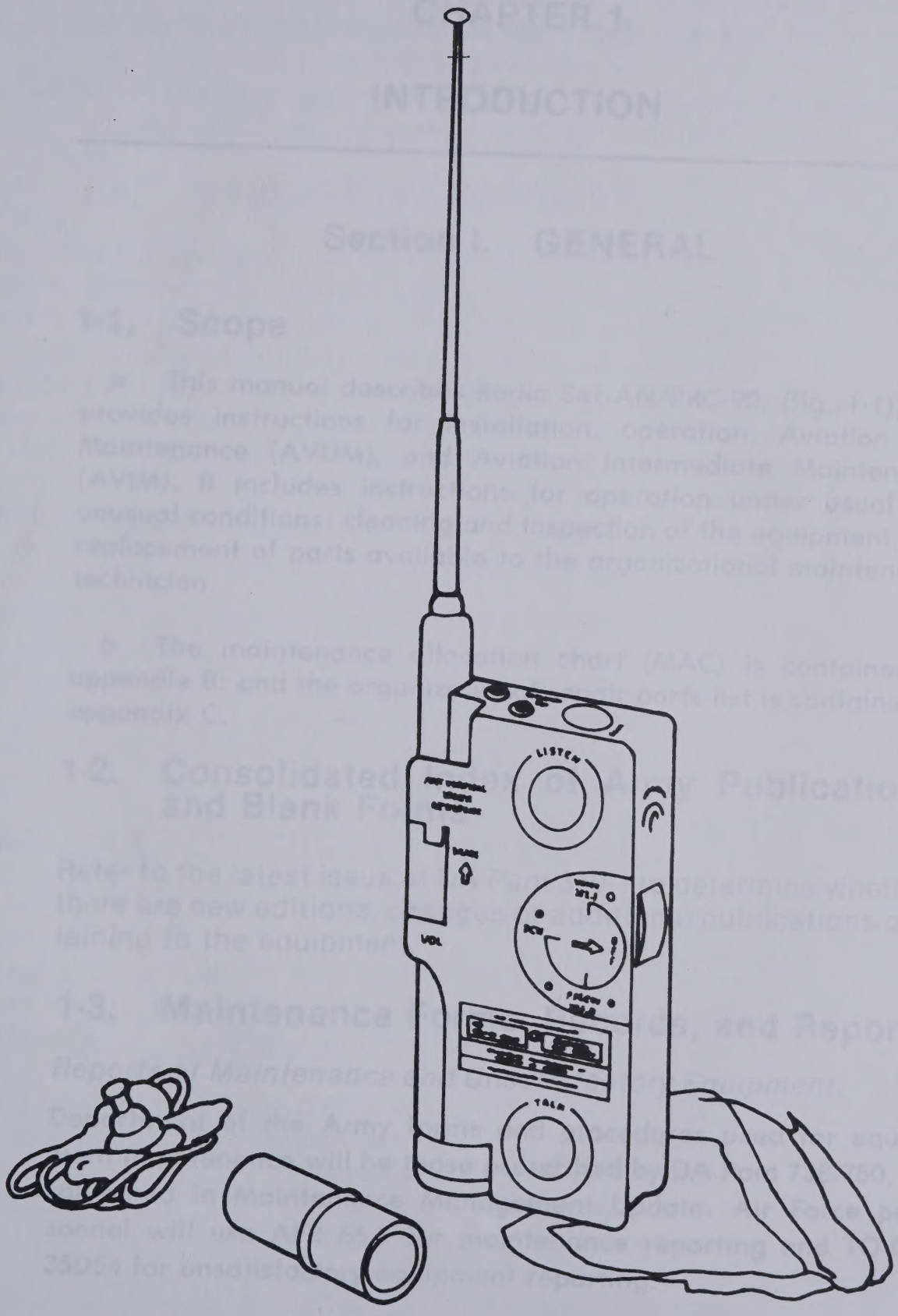
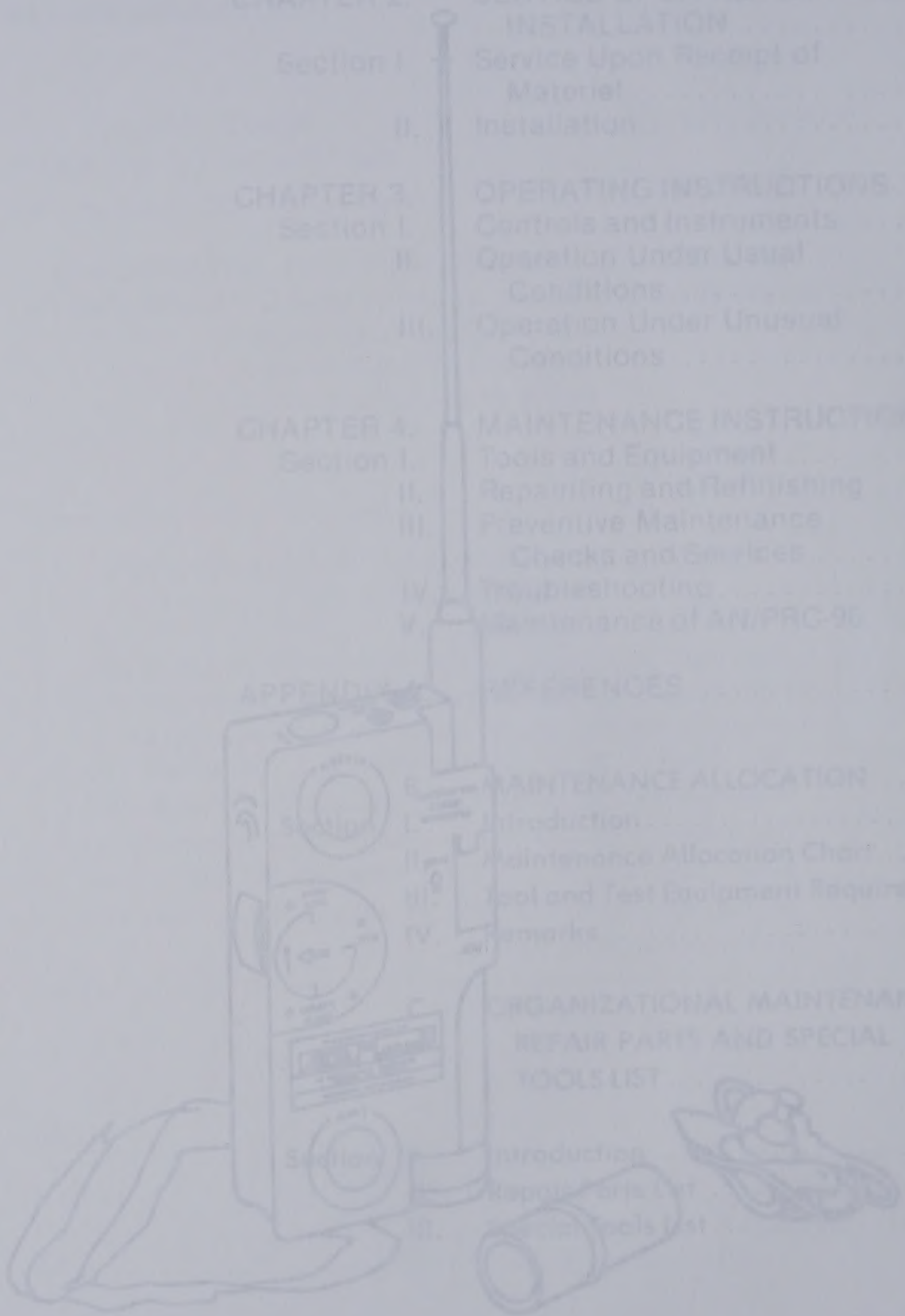


Figure 1-1. Radio Set AN/PRC-90.



CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Radio Set AN/PRC-90, (fig. 1-1), and provides instructions for installation, operation, Aviation Unit Maintenance (AVUM), and Aviation Intermediate Maintenance (AVIM). It includes instructions for operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available to the organizational maintenance technician.

b. The maintenance allocation chart (MAC) is contained in appendix B; and the organizational repair parts list is contained in appendix C.

1-2. Consolidated Index of Army Publications and Blank Forms

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1-3. Maintenance Forms, Records, and Reports

Reports of Maintenance and Unsatisfactory Equipment.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, as contained in Maintenance Management Update. Air Force personnel will use AFR 66-1 for maintenance reporting and TO-00-35D54 for unsatisfactory equipment reporting.

1-4. Destruction of Electronic Material

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-5. Administrative Storage

Administrative Storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage the PMCS should be performed to assure operational readiness. Disassembly and repacking of equipment for shipment or limited storage are covered in paragraphs 2-2, 3-7, 3-8 and 4-7.

1-6. Reporting Equipment Improvement Recommendations (EIR)

If your radio set needs improvement, let us know. Send us an EIR. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP Fort Monmouth, New Jersey 07703. We'll send you a reply.

Section II. DESCRIPTION AND DATA

1-7. Purpose and Use

a. Purpose. Radio Set AN/PRC-90 is an emergency locator transceiver to be used by aircrew members for communication with search and rescue ships, vehicles, or aircraft equipped with compatible radio equipment.

b. Use. Radio Set AN/PRC-90 is included as part of each survival package and may be issued to individuals when so directed by the commander. It provides modulated CW, beacon, or AM voice operation on 282.8 and 243.0 MHz, using a self-contained microphone and speaker (or earphone) and a detachable half-wave, base-loaded whip antenna. It is battery operated and cannot be recharged. Ground-to-air operation of up to 80 nautical miles and line-of-sight operation between

ground units of one-half to one mile can be assumed. Obstructions, earth minerals, antenna positioning, and atmospheric conditions will limit transceiver range.

c. Components. Repairable components for Radio Set AN/PRC-90 are listed in appendix B.

1-8. Technical Characteristics

a. General.

Frequency:	
Transmit	282.8 MHz (voice) 243.0 MHz (voice, mcw, and beacon
Receive	282.8 MHz ± 0.005% 243.0 MHz ± 0.005%
Frequency Stability	± 0.005%
Range:	
Ground-to-air (typical, with air craft at 10,000-foot alt.):	
Voice mode	60 nm
Beacon mode	80 nm
MCW mode	80 nm
ADF locator range	50 nm
Ground-to-ground	1 mile, line of sight, typical
Available channels	2
Channel spacing	39.8 MHz
Antenna	Half-wave, base-loaded, flexible whip; omnidirectional; vertically polarized.
Operating modes	Voice, mcw, and beacon.
Battery BA-1568/U:	
Type	14.0 volts, mercury alkaline.

Nominal voltage	12.0 volts
Operational voltage range	10.0 to 14.0 volts 100mA
Input current drain	40 ma, receive; transmit voice mode idle.
Battery life	14 hours maximum in beacon mode. 10 hours maximum in Voice/MCW mode. (1000 ma/hr at 70 ma.)
Battery Shelf Life	**3 years**
Dimensions (with battery, less earphone cartridge, straps, and antenna):	
Height	6 in.
Width	3 1/16 in.
Thickness	1 7/16 in.
Earphone case	2 7/8 by 1 1/4 in, cylindrical
Battery	1 by 3 in., cylindrical
Reliability	800 hours MTBF
Weight:	
Unit and earphone cartridge, less battery	14 oz.
Unit with earphone kit and battery	22 oz.

b. Transmitter.

Power output:	
Beacon and mcw mode	500 mw, PEP, minimum
Voice mode	400 mw, PEP, minimum
Frequency control	Quartz crystal, overtone
Modulation	80 percent, minimum
Harmonic Distortion:	
Normal battery	15%, maximum
Low battery	20%, maximum
Fidelity	+ 1,-3db through dynamic range (ref 1KHz)
Modulation Range:	
Voice Mode	500 to 3000 Hz

Beacon mode:	
Modulation type	AM
Frequency (rectangular waveshape)	300 to 1,000 Hz ±20% at 2 to 3 Hz rep rate and 5% retrace, maximum
Sweep direction	Downward
MCW mode:	
Modulation	AM
Frequency (rectangular waveshape	1000 Hz ±20%
Keying	Pushbutton
Sidetone	In beacon and mcw modes the speaker emits an audible, lowlevel sidetone.
Output impedance	50 ohms, unbalanced
Duty Cycle	100%
Ambient conditions:	
Elevation	40,000 feet above MSL
Explosive decompression	To 40,000 feet (5.54"Hg)
Humidity	90%, relative
Temperature:	
Storage	-60° to +60° C. (-76° to +140°F.)
Operating	-30° to +50°C. (-22° to +122°F.) (Excluding battery limits.)
Pressure (Salt water submersion limits):	
Short term (5 minutes)	50 feet, maximum
Long term (24 hours)	2 feet, maximum

c. Receiver.

Type	Super regenerative, AM
Tuning	Crystal Controlled

Sensitivity	5 microvolts, minimum for 6dB signal-plus-noise to noise ratio
Selectivity:	
Bandwidth at 450 KHz	Less than 6dB down from center frequency response.
Bandwidth at ± 10 MHz	At least 60 db down
Local oscillator radiation	Limited to permit two (2) sets to operate within at least 10 feet separation with less than 1.0 db signal degradation.
Audio frequency response	500 to 3000 Hz; + 2, -5db (ref 1KHz)
Audio output:	
Voice	0 to 22 mw, variable
Beacon and mcw (sidetone)	3.52 to 8.8 mw, fixed

1-9. Items Comprising Radio Set AN/PRC-90 (fig. 1-1)

The items in table 1-1 make up an operational Radio Set AN/PRC-90. One copy of this manual is packed with each AN/PRC-90.

Table 1-1. Items Comprising Radio Set AN/PRC-90

NSN	Item	Quantity	Dimensions H	W	D	Weight
5820-00-782-5308	Radio Set AN/PRC-90	1	8¼	6½	3¼	1.5lb
5820-00-371-6806	Antenna	1				
6135-00-838-0706	Battery, BA-1568/U	1	3	1	1	
5820-00-041-1352	Battery Cap and Retainer	1				
5965-00-121-7569	Headset, Electrical	1				
5965-00-497-1130	Case, Headset	1	3	2	2(cyl)	
5820-00-422-3081	Wrist Strap	1				
5360-00-151-5903	Helical Spring	1				
5330-00-928-7029	Washer Sealing	1				

1-10. Description of Equipment (fig. 1-1)

a. Radio Set AN/PRC-90 is a small emergency transceiver contained in a moisture resistant cast aluminum enclosure. Its working controls and accessory connections assure protection against high-altitude decompression, landing shocks, submersion in salt water, and exposure to extremes in atmospheric conditions.

b. An earphone is included in an attached polyvinyl container for use when the speaker output is not desired.

c. Transceiver operating modes can be selected by rotating the function switch. Supplementary control is through a watertight mcw (code) pushbutton. In the voice mode, speaker or earphone volume can be varied by the VOL control with an arrow indicating the maximum-volume position.

d. The battery can be removed by unscrewing a watertight cap on the lower corner.

e. The unit is normally packaged with the antenna attached and bent around the unit to conserve space. Telescoping antenna, fully extended, is broadbanded and presents a nominal impedance of 50 ohms.

f. A copy of the manual is included in a watertight container for operator assistance.

g. The unit is finished in a dull olive drab, baked-enamel finish with white-enamel-filled etched labels near controls.

CHAPTER 2

SERVICE UPON RECEIPT AND INSTALLATION

Section I. SERVICE UPON RECEIPT OF MATERIEL

2-1. General

The AN/PRC-90 is a small battery operated radio transceiver which is used by downed airmen as an emergency locator beacon transmitter and can be used for voice or code (MCW) transmission and reception. It requires minimum service assuming normal maintenance. No systems planning or physical installation procedures are required. Service upon receipt is performed by organizational maintenance personnel.

2-2. Unpacking (fig. 2-1)

Radio Set AN/PRC-90 and the technical manual are enclosed in a cushioned watertight container within a corrugated fiberboard carton for shipment to organizational level.

CAUTION

If conditions permit, remove any salt water accumulations from packing container before opening to prevent corrosion. Do not open the AN/PRC-90 transceiver case except for battery access.

a. Cut away sealing tape and remove the AN/PRC-90 and technical manual packet.

b. Remove battery from its container

2-3. Checking Unpacked Equipment

NOTE

Inspection of equipment must be performed by organizational or higher category maintenance personnel. This section is not applicable to service operation.

a. Inspect the overall condition of the equipment. Check for fractures, dents, scratches, or missing parts (fig. 1-1 and 2-1).

b. Check contents against packing slip or refer to table 1-1.

c. Check controls on unit. Microswitch operation can be heard when the MCW or PUSH TO TALK buttons are pressed. Operate the mode/OFF switch and VOL control for evidence of malfunction. Check to see that antenna is clean and snaps to the erect position when released from the stowed position. Check telescoping sections for proper operation or bent sections. Check to see that identification and code plates are clean and legible.

NOTE

Some antennas have a loose-fitting cover which may appear twisted or wrinkled. The antenna is not defective unless the rubber is cracked or broken.

d. Check for presence of battery and report presence of any corrosion in battery enclosure.

e. Report any discrepancies in accordance with TM 38-750 (para 1-3).

f. If the equipment has been used or reconditioned, see whether it has been changed by a modification work order (MWO). If the equipment has been modified, the MWO number will appear on the face of the AN/PRC-90 or near the nomenclature plate. If modified, see that any operational or maintenance instruction changes resulting from the modification have been entered in the equipment manual.

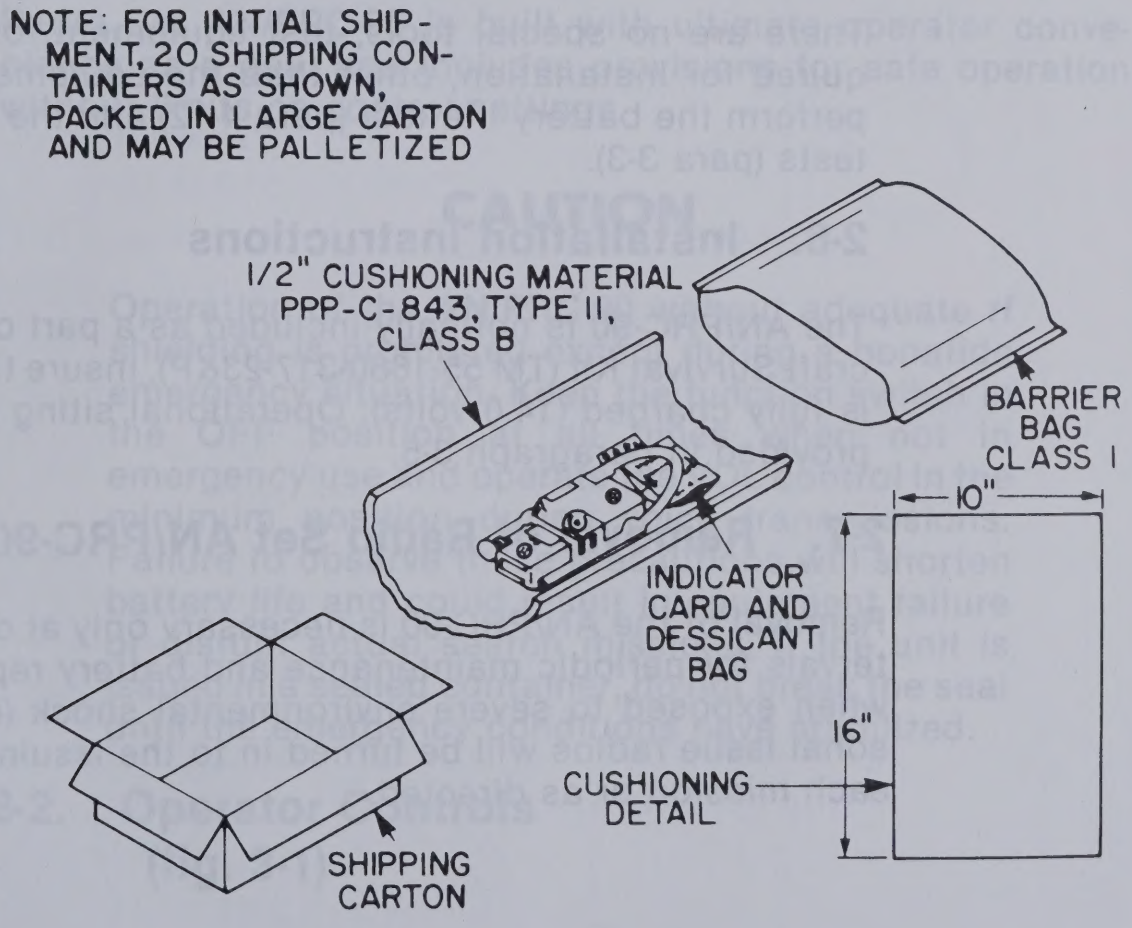


Figure 2-1. Radio Set AN/PRC-90, shipping container detail.

Section II. INSTALLATION

2-4. General

The AN/PRC-90 is provided in a simplified packaging and operational arrangement. Siting is covered in paragraph 3-5. No shelter or systems planning procedures are necessary.

2-5. Tools, Test Equipment, and Materials Required for Installation

There are no special tools, test equipment, or materials required for installation, other than the equipment required to perform the battery life test (para 4-12) and the radio preflight tests (para 3-3).

2-6. Installation Instructions

The AN/PRC-90 is normally included as a part of an Army Aircraft Survival Kit (TM 55-1680-317-23&P). Insure that the battery is fully charged (14.0 volts). Operational siting information is provided in paragraph 3-5.

2-7. Removal of Radio Set AN/PRC-90

Removal of the AN/PRC-90 is necessary only at designated intervals for periodic maintenance and battery replacement, or when exposed to severe environmental shock (chap. 4). Personal issue radios will be turned in to the issuing office after each mission or as directed.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INSTRUMENTS

3-1. Equipment Damage and Warnings (fig. 3-1)

Radio Set AN/PRC-90 is built with ultimate operator convenience as a goal and includes provisions for safe operation without limits on control settings.

CAUTION

Operation of the AN/PRC-90 without adequate rf shielding is prohibited except during a bonafide emergency situation. Keep the function switch in the OFF position at all times when not in emergency use and operate the VOL control in the minimum position during voice transmissions. Failure to observe these precautions will shorten battery life and could result in equipment failure or disrupt actual search missions. If the unit is issued in a sealed container, do not break the seal until the emergency conditions have stabilized.

3-2. Operator Controls (fig. 3-1)

Controls and connectors for the AN/PRC-90 are shown in table 3-1.

Table 3-1. Controls, Indicators, and Connectors

Controls, Indicators, and Connectors	*Function*
Function switch	Selects transceiver operating mode and turns set off (para 3-4).
Function switch arrow/ pushbutton.	Indicates operating mode and locks out 282.8 MHz unless depressed.
MCW pushbutton, sealed . .	Activates microswitch which provides modulated CW output on 243.0 MHz.
PUSH TO TALK push-button.	Permits simplex voice transmission on 282.8 or 243.0 MHz.
VOL/MAX control	Adjusts LISTEN speaker output level only in VOICE or VOICE/MCW modes.
LISTEN disc	Sealed speaker button.
TALK disc	Sealed microphone button.
EARPHONE connectors . . .	Waterproof, unbalanced output for earphone.
Battery cover	Watertight, negative-ground battery cover.
Front and rear identification and instruction labels.	Front label identifies the radio set and manufacturer. Rear labels include set OPERATING INSTRUCTIONS and 36 alphanumeric characters and corresponding MCW (modulated) CW Morse code pulse groups.

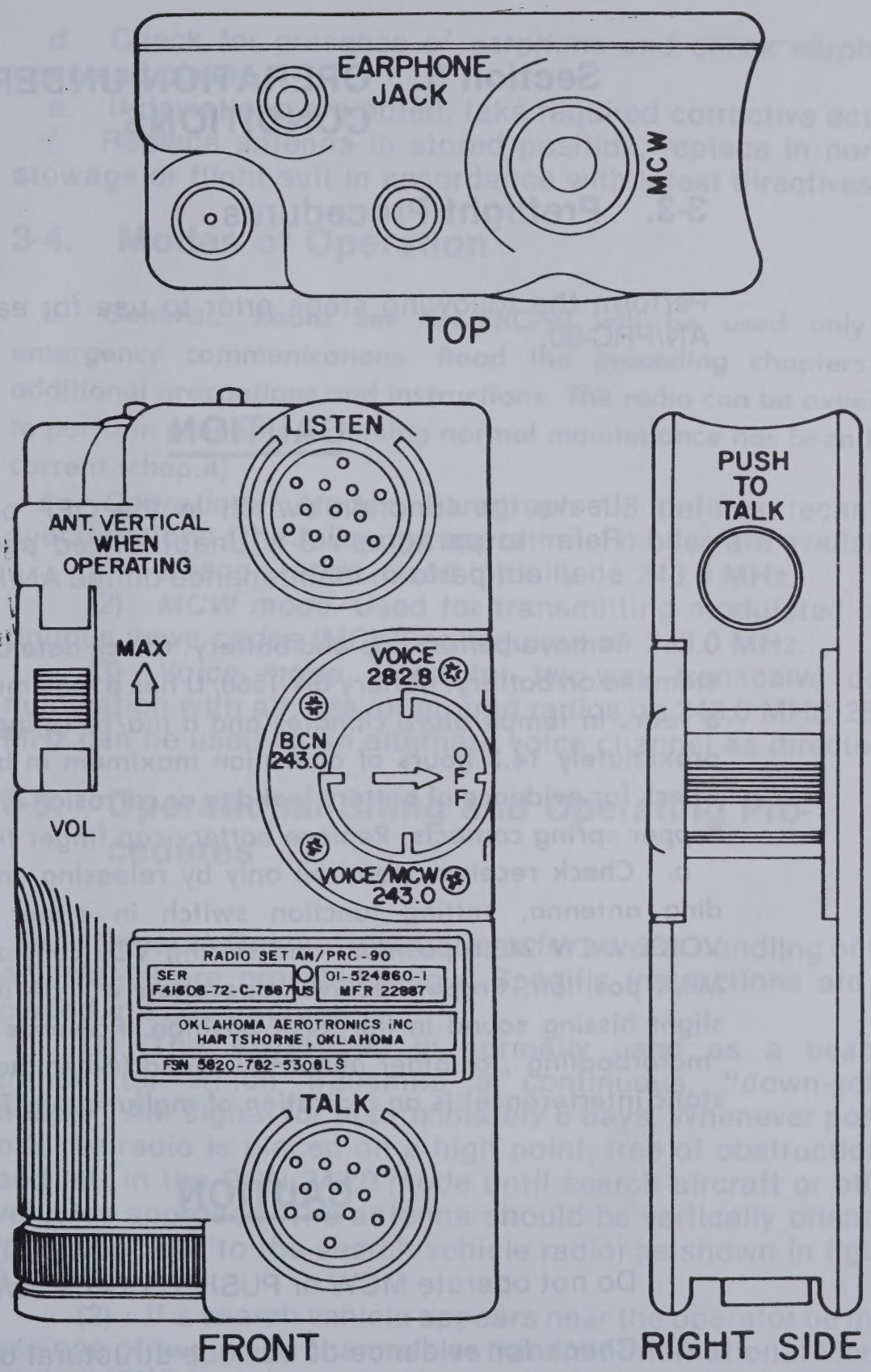


Figure 3-1. Radio Set AN/PRC-90, controls and indicators.

Section II. OPERATION UNDER USUAL CONDITIONS

3-3. Preflight Procedures

Perform the following steps prior to use for each Radio Set AN/PRC-90.

CAUTION

Leave the function switch in the OFF position. Refer to paragraph 3-1. Unauthorized personnel shall not perform maintenance on the AN/PRC-90.

a. Remove battery cap and battery. Check date of manufacture stamped on battery. Battery BA-1568/U has a maximum shelf life of 3 years in temperature climates and a ma/hr rating of 1,000 (approximately 14.3 hours of operation maximum in beacon mode). Check for evidence of battery leakage or corrosion and condition of copper spring contacts. Replace battery cap finger tight.

b. Check receive operation only by releasing and fully extending antenna, setting function switch in either VOICE 282.8 VOICE/MCW 243.0 position, and setting VOL control towards the MAX position. Proper receiver operation will be indicated by a slight hissing sound in the MAX position. Presence of squealing, "motorboating", or other abnormal sound (other than normal AM static interference) is an indication of malfunction. Turn set OFF.

CAUTION

Do not operate MCW or PUSH TO TALK switches.

c. Check for evidence of obvious structural damage such as cracked case, perforated seals, or presence of salt, sand, or oil accumulations.

d. Check for presence of earphone and check earphone case and cover.

e. If deviations are noted, take required corrective action.

f. Replace antenna in stored position, replace in normal stowage or flight suit in accordance with latest directives.

3-4. Modes of Operation

a. General. Radio Set AN/PRC-90 will be used only for emergency communications. Read the preceding chapters for additional precautions and instructions. The radio can be expected to perform properly, assuming normal maintenance has been kept current (chap.4).

b. Operational Modes. Paragraph 1-8 defines technical specifications. The following operational modes are available:

(1) *Beacon mode.* Used initially on 243.0 MHz.

(2) *MCW mode.* Used for transmitting modulated continuous wave codes (MCW) as required on 243.0 MHz.

(3) *Voice mode.* Used for two-way transceive communication with air, sea, or ground radios on 243.0 MHz. 282.0 MHz can be used as an alternate voice channel as directed.

3-5. Operational Siting and Operating Procedures

a. General. General instructions for correct handling of the AN/PRC-90 are provided below. Specific instructions are included in subparagraph *b.*

(1) The AN/PRC-90 is normally used as a beacon transmitter which transmits a continuous, "down-going beeper" AM signal for approximately 6 days. Whenever possible, the radio is placed on a high point, free of obstructions, and left in the BCN 243.0 mode until search aircraft or other vehicles approach. The antenna should be vertically oriented (perpendicular to the search vehicle radio) as shown in figure 3-2.

(2) If a search vehicle appears near the operator he may use one of two voice channels or transmit international Morse Code (MCW) to communicate with the search vehicle.

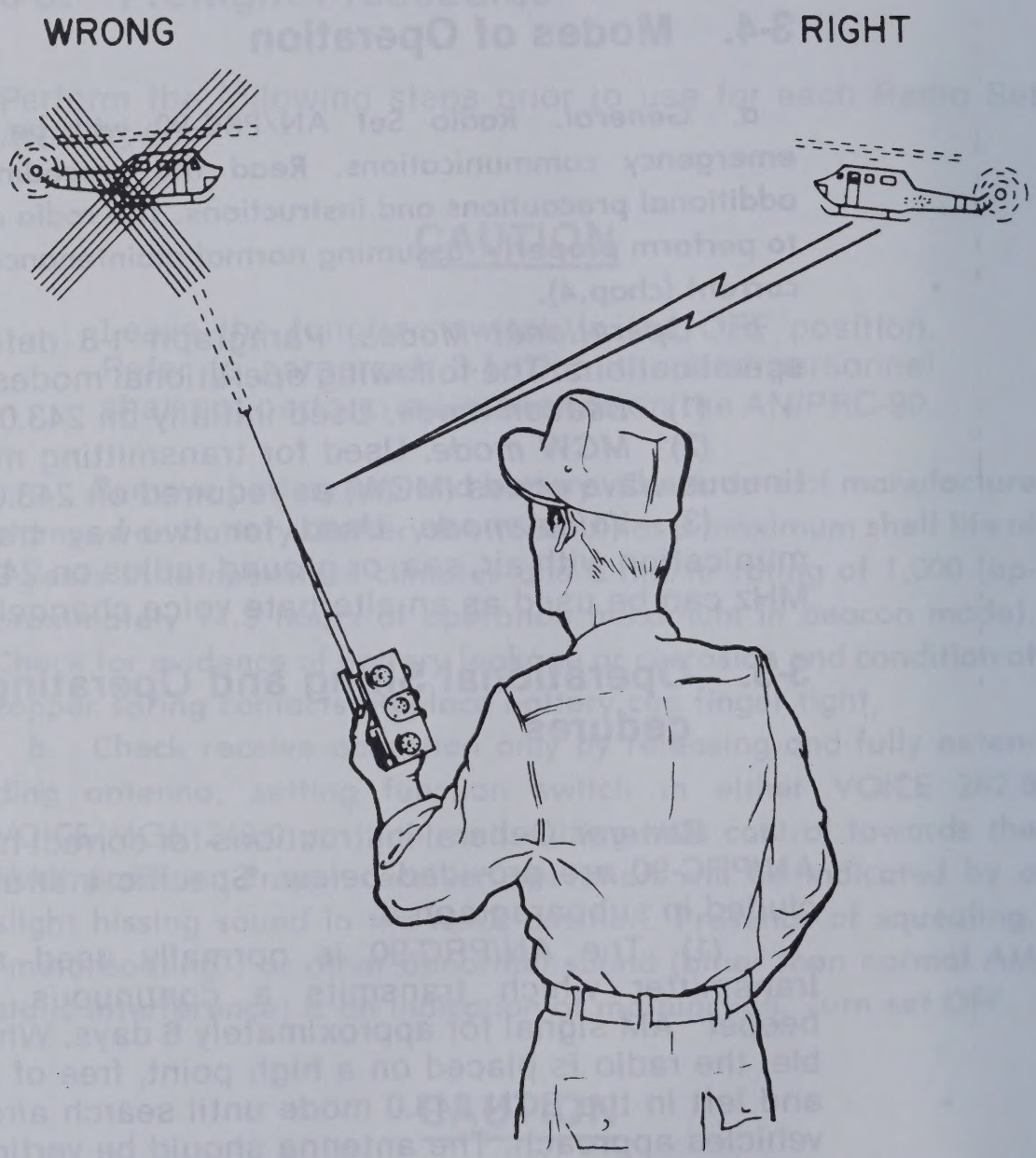


Figure 3-2. Antenna orientation.

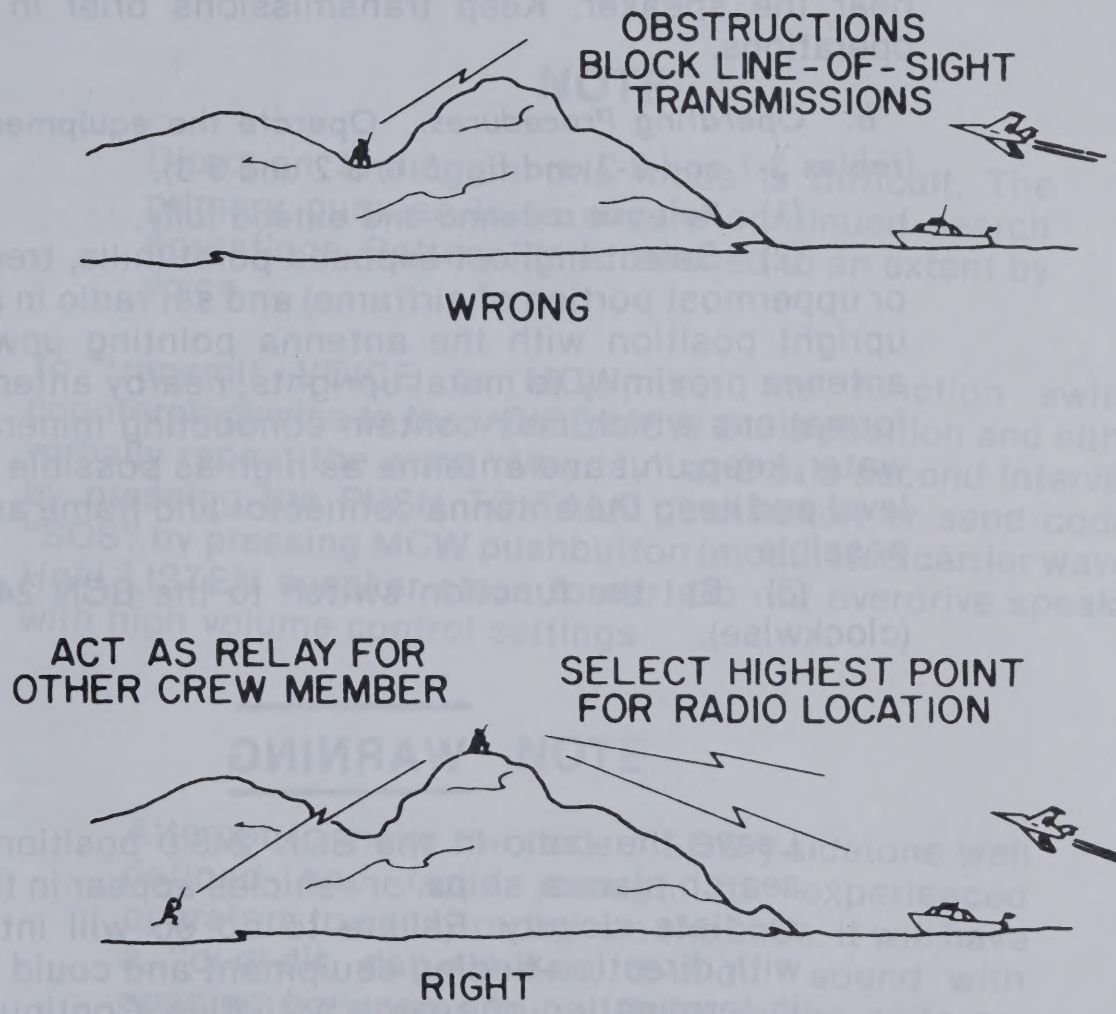


Figure 3-3. Operational siting under search mission conditions.

(3) When informed that a firm location has been determined, the radio can be used to communicate with other crewmen to join forces for recovery operations.

(4) If the radio is being used for tactical operations only, use the earphone when enemy forces are near enough to hear the speaker. Keep transmissions brief in all tactical operations.

b. Operating Procedures. Operate the equipment as follows (tables 3-1 and 3-2 and fig. 3-1, 3-2 and 3-3).

(1) Release antenna and extend fully.

(2) Select highest exposed point (hills, trees, rooftops, or uppermost portion of airframe) and set radio in a secure and upright position with the antenna pointing upwards. Avoid antenna proximity to metal uprights, nearby antennas, or rock formations which may contain conducting minerals. If in the water, keep unit and antenna as high as possible above water level and keep the antenna connector and frame area as dry as possible.

(3) Set the function switch to the BCN 243.0 position (clockwise).

WARNING

Leave the radio in the BCN 243.0 position until search planes, ships, or vehicles appear in the immediate vicinity. Failure to do so will interfere with direction-finding equipment and could result in termination of search activities. Continue this mode for at least 14 hours or until search vehicles are contacted. Battery and beacon failure is indicated by loss of beacon sidetone in the speaker (or earphone). If more than one AN/PRC-90 is available, use only one at a time and share batteries to extend the transmission period.

(4) Prior to visual contact with search craft, and if reasonable doubt exists as to proper beacon operation, occasional brief voice or mcw ("Mayday" or "SOS") transmissions can be made. Limit such transmissions to daylight hours for

best propagation. Follow a 2-minute-on, 1-minute-off; 3-minute-on, 2-minute-off; and 10-minute-on procedure. Make the "Mayday" and/or "SOS" transmissions once just after sunrise, once at noon, and once near sundown to take advantage of improved propagation. Meteorological conditions will affect transmission range and quality.

NOTE

Direction finding in this mode is difficult. The primary purpose is to ensure continued search operations. Battery life is reduced to an extent by voice.

To transmit VOICE or MCW, set the function switch counterclockwise to the VOICE/MCW 243.0 position and either verbally repeat the word "Mayday" at 2 or 3 second intervals by pressing the PUSH TO TALK pushbutton or send coded "SOS" by pressing MCW pushbutton (modulated carrier wave). Hold LISTEN speaker close to ear. Do not overdrive speaker with high volume control settings.

NOTE

Attempt to make the code ("SOS") sidetone well defined and rapid enough for experienced operators to easily recognize the code. It will have a "di-di-dit, dah-dah-dah, di-di-dit" sound with spacing between groups. Refer to the code explanation on the rear panel.

(5) If reasonable doubt exists that the 243.0 MHz transmitter is functioning, set the function switch to the VOICE 282.8 position and transmit speech only as described in step (4) above.

NOTE

The function arrowhead button must be pressed to release the switch for 282.8 MHz operation.

(6) Repeat steps (1), (2) and (3) above.

(7) When a rescue craft is within sight, call the rescue radio operator as follows. Turn the function switch clockwise to the VOICE/MCW 243.0 position and use the calling procedure outlined in table 3-2. Press the PUSH TO TALK button and speak in a normal voice near the microphone during transmissions. Do not shout. This procedure will result in a more intelligible transmission. Place the VOL control in a position that provides adequate audio volume from the speaker (or earphone).

NOTE

Widely separated crewmen may be making simultaneous transmissions. Rescue operator will assign transmission to avoid carrier heterodyne interference on the same channel or advise switching the function switch to the alternate channel (VOICE-282.8). If contact is broken, return to the VOICE/MCW 243.0 position and repeat step (7).

(8) Leave controls set for voice operation until rescue personnel are within speaking distance or otherwise ordered.

3-6. Stopping Procedure

When the requirement for radio transmissions is past, turn the function switch to the OFF position and place the radio in its stowage compartment.

Table 3-2. Recommended Voice Operating Practices

Originating Call AN/PRC-90	*Probable Reply*
"CQ rescue craft, CQ,CQ,CQ. Over."	None or "Roger, roger, roger." Read you five by five (or other signal report).
If no reply received, continue to call "CQ" on voice or MCW at intervals until reply is received.	
"Roger, roger. Crew status follows. Over." (Report crew physical status, missing crew members, and any emergency logistics or medical requirements.)	"Roger. Your transmission understood. Standby for reply. Out." (Or other pertinent reply.)
"Roger. Out."	

Section III. OPERATION UNDER UNUSUAL CONDITIONS

3-7. Operating and Storage Limitations

a. Operation of the AN/PRC-90 will span a wide range of weather normally at temperatures of -30° to +50° C. (-22° to +122° F.) and may be stored at from -60° to +60° C. (-76° to +140° F.).

NOTE

Battery will not operate below 0°C.

b. Equipment operated at low temperatures should be kept in low temperature storage when not in use. Store the equipment in a shipping carton and cover the carton with water-repellent material.

c. When the equipment is to be operated at freezing temperatures, perform the following procedure before operating the equipment.

(1) Remove battery and keep it warm.

(2) Use water-repellent material (SB 38-100) to cover the shipping carton during periods of high humidity.

3-8. Operation in Desert and Tropical Areas

a. Desert Regions. Before using the equipment in desert regions, remove all sand and dust. Blow and shake sand out of speaker and microphone.

b. Tropical Regions. In climates of high humidity, such as tropics, inspect the equipment daily for fungus, mold, insects, and metallic corrosion.

CAUTION

Do not open the AN/PRC-90 case chassis. Only higher category maintenance personnel may work on components. Opening the case will permit moisture and dust to enter the unit, resulting in a possible malfunction.

3-9. Operation in Maritime, High Altitude, or Rainy Areas

Keep the AN/PRC-90 in a dry area if possible. Avoid rigging any cover materials near the antenna in salt atmosphere. Watch for accumulations of salt between the antenna base and the radio. Remove any fouling sediment to assure proper operation. No special procedures are required for high-altitude operation.

3-10. Recognition and Identification of Jamming

Under tactical conditions, the AN/PRC-90 may be jammed by the enemy. This jamming may be planned or accidental and will usually be caused by a strong signal transmitted on the same frequency as that being used. The signal being transmitted may be a steady carrier or a modulated carrier. When it becomes difficult or impossible to receive the desired signal, switch the function switch to the alternate voice channel or revert from the voice to the mcw mode and attempt cw contact.

CHAPTER 4

MAINTENANCE

Section I. TOOLS AND EQUIPMENT

4-1. General

The purpose of this chapter is to provide instructions enabling maintenance personnel to test, troubleshoot, and repair the radio set and thereby ensure its serviceability. Except for certain accessible and necessarily replaceable components, such as straps, some switches, volume control, housing, and covers which are field replaceable, the majority of internal electrical repair is performed by depot.

4-2. Repair Parts and Special Tools List

a. Repair Parts. See Table 1-1, page 1-7.

b. Special Tools. No special tools are required with the exception of the small spanner wrench furnished with Radio Test Set AN/PRM-32.

4-3. Special Test Equipment

a. Radio Test Set AN/PRM-32 (NSN 6625-00-803-3399).

OR

Radio Test Set AN/PRM-32A (NSN 6625-01-013-9900).

b. Battery Tester TS-2530/UR (NSN 6625-00-933-6112).

OR

Battery Tester TS-2530A/UR (NSN 6625-00-238-0223).

c. Battery Test Adapter MX-8801/PRC-90 (NSN 6625-00-480-6315).

d. Tool Kit, Electronic Equipment TK-101/G (NSN 5180-00-064-5178).

4-4. Materials Required for Organizational Maintenance

a. Trichlorotrifluoroethane (cleaning compound) (NSN 6850-00-105-3084).

b. Camel's-hair brush (NSN 8020-00-242-9625).

c. Lint free cloth (NSN 8305-00-170-5062).

d. Fungus removal solution (NSN 6850-00-133-0695).

e. Lens tissue (NSN 6640-00-393-2090).

f. Sandpaper, fine (NSN 5350-00-264-3485) (or pencil eraser).

g. Mild acid solution (boric acid solution or vinegar).

h. Paint, olive drab.

i. Paint, white.

j. Varnish.

Section II. REPAINTING AND REFINISHING INSTRUCTIONS

4-5. Cleaning

a. Brush dirt and dust from the exterior surfaces of the AN/PRC-90 with a camel's-hair brush and a clean, lint-free cloth.

b. If any mildew or fungus is present, moisten a clean, lint-free cloth in the fungus removal solution and rub the area until the fungus is removed. Dry the area with a dry, clean, lint-free cloth.

c. Remove dust or dirt from control surfaces with a brush.

d. Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper or rubbing with an abrasive eraser.

e. Clean battery enclosure and contacts with mild ascetic solution (boric acid or vinegar) followed by clear water rinse. Burnish with pencil eraser or equivalent.

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

f. Remove grease and ground-in dirt from the exterior surfaces of the case with a cloth dampened (not wet) with trichlorotrifluoroethane. Allow to dry out thoroughly.

g. If the radio set has been exposed to salt water or if such exposure is suspected because of difficulty in operating the function switch, wash the radio set in fresh water. To do this, immerse the entire radio in a basin of fresh water and agitate while operating the function switch. If repeated fresh water washings do not free the function switch, send the radio set to field maintenance for dissassembled cleaning or replacement of the function switch.

4-6. Repainting and Refinishing

a. Perform cleaning procedure outlined in paragraph 4-5.

b. Sand as required to prepare a smooth surface, using No. 400 wet or dry paper. Remove dust and repeat step 4-5*f*.

c. Brush two coats of primer on bare metal surfaces. Use enough thinner to avoid pileups. Allow to dry thoroughly between coats.

d. Apply two thin coats of OD paint (No. 24081, MIL-STD-595) evenly to all exterior surfaces. Allow to dry thoroughly.

e. Fill etched letters and numbers with white crayon paint filler Type I (color No. 37778 per MIL-STD-595). Allow to dry thoroughly.

NOTE

Refer to applicable cleaning and refinishing, as required, specified in TB 43-0118.

4-7. Storage

a. Normal Storage. Store the AN/PRC-90 in a watertight container when not in use, and place the required number of active desiccant units (SB 38-100) inside the container. Seal the container with waterproof tape. When practical, store the AN/PRC-90 in a tightly closed cabinet and place desiccant inside the cabinet.

b. Storage in Maritime, High Altitude, or Rainy Areas. To prevent corrosion from salt air or saltwater spray, and from rust caused by condensation when the AN/PRC-90 is stored, wipe all exposed metal surfaces with a soft, clean, lint-free cloth moistened with lubricating oil, general purpose (NSN 9150-00-273-2389). To avoid condensation, transfer the equipment from cold to warmer temperatures by gradual stages. Package as described in subparagraph *a* and keep the equipment in low temperature storage. Check the condition of the AN/PRC-90 before and after each mission. To avoid corrosion damage remove battery during storage.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4-8. Preflight Checks and Services

Preflight maintenance checks on the AN/PRC-90 are performed before flight and/or weekly. Table 4-1 lists preflight checks and services. The first column lists the item number. The second column lists the interval within which these checks are to be performed. The third column lists the item to be inspected. The fourth column lists procedures and checks.

4-9. Preventive Maintenance Checks and Services

Preventive Maintenance Checks and Services at AVUM level are made at 30 day intervals and after each period of operational use. Table 4-2 lists the preventive maintenance checks and services for AVUM level repair. Additionally, each AN/PRC-90 is to be sent to AVIM for Performance Test Procedures (para 4-12) at a maximum of 120 day intervals. Maintenance forms and records to be used and maintained on this equipment are specified in DA Pam 738-750 as contained in Maintenance Management Update.

Table 4-1. Preflight Preventive Maintenance Checks and Services

W - Before flight or weekly

ITEM NO.	INTERVAL W	ITEM TO BE INSPECTED	PROCEDURE
1	●	Exposed Metal Surfaces	Inspect metal surfaces for signs of rust and corrosion.
2	●	Wrist Strap	Inspect strap for mildew, fungus, dry rot, or insect damage
3	●	Battery cap and retainer	Check for proper removal and reassembly, broken retainer, and internal corrosion.
4	●	Antenna	Check condition for corrosion, cross threading, or bent connector parts. Check for antenna cover material breakdown.
5	●	Battery	Remove battery and check it and both battery contacts for signs of corrosion or alkaline leakage.

Table 4-1. Preflight Preventive Maintenance Checks and Services - Continued.

6	●	Headset, Electrical	Remove earphone from its case and check for signs of corrosion or insulation breakdown. Clean earpiece.
7	●	Case, Headset	Check case for loose snap, or material breakdown.
8	●	Controls	With battery removed, operate switches and check for chipped paint, faded identification symbols, or evidence of damage.
9	●	Hermetic Switch Seals	Check for cracks in the MCW and PUSH TO TALK switch covers.
10	●	Replacement	If radio appears unsatisfactory, replace the radio.

Table 4-2. Organizational Preventive Maintenance Checks and Services

A, M- After Operation and/or Monthly

ITEM NO.	INTERVAL A, M	ITEM TO BE INSPECTED	PROCEDURE
			CAUTION At organizational levels, the AN/PRC-90 is not opened for direct access to the circuits and the test sets are designed for proper tests without damage to the radio; however, if evidence of malfunctioning radios is noted, higher level maintenance is mandatory. Aircrew members depend on the AN/PRC-90 for survival.
1	•	Visual Inspection and Control Functions	Check exposed surfaces and general appearance of the AN/PRC-90 (battery terminals, battery, wrist strap, earphone, and antenna) for fungus, salt accumulation,

Table 4-2. Organizational Preventive Maintenance Checks and Services - Continued:

			and obvious signs of failure. Check physical operation of controls with battery removed (table 4-1).
2	●	Battery Test	Check Battery BA-1568/U, using Battery Test Set TS-2530/UR and Battery Test Adapter MX-8801/PRC-90 (para 4-13).
3	●	Radio Set AN/PRC-90	Check Radio Set AN/PRC-90 for proper operation in all modes, using Radio Test Set AN/PRM-32 (para 4-12).
4	●	Publications	Check DA Pam 310-1 to insure that all publications are current, complete, and serviceable.
5	●	Modifications	Check DA Pam 310-1 to determine if MWOs have been published. All URGENT MWOs require immediate and mandatory implementation. All NORMAL MWOs must be scheduled.
6	●	Records and Reports	Record and report results of checks and services in accordance with TM 38-750.

Section IV. TROUBLESHOOTING

4-10. Troubleshooting Procedures

a. Troubleshooting of the AN/PRC-90 is based on reports of malfunctions that may occur in flight and on the results obtained during preliminary attempts to correct the malfunction.

b. To troubleshoot the AN/PRC-90, check the list of malfunctions in table 4-3. Perform the tests, inspections, and corrective actions as indicated. If the corrective actions indicated do not correct the malfunction, refer the equipment to higher category of maintenance.

Table 4-3 Organizational Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. AN/PRC-90 INOPERATIVE IN ALL MODES.
Step 1. Check for Battery BA-1568/U discharge or corrosion. Replace battery.
Step 2. Check for bent or corroded battery spring contacts. Clean and burnish spring contacts. (para 4-4 and 4-5)
Step 3. Check for circuit or control malfunction. Perform radio test set procedures to check for total malfunction.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

CAUTION

Internal spring contact is set in epoxy and cannot be replaced at organizational levels. Do not open AN/PRC-90 case or remove operating controls or covers.

Refer to higher maintenance category.

2. AN/PRC-90 OPERATES, BUT EARPHONE IS INOPERATIVE.

Step 1. Check for poor connections.
Operate with an earphone known to be good.

Step 2. Probable broken transducer, or internal open circuit.
Refer to higher maintenance category.

3. AN/PRC-90 TRANSMITS, BUT SPEAKER AND EARPHONE ARE INOPERATIVE.

Probable receiver or audio circuit malfunction.
Refer to higher maintenance category.

4. AN/PRC-90 RECEIVES, BUT ONE OR ALL TRANSMIT MODES INDICATE MALFUNCTION.

Inspect for probable transmitter or modulator amplifier malfunction.
Refer to higher maintenance category.

5. AN/PRC-90 OPERATES PROPERLY ON ONE FREQUENCY, BUT FAILS IN SECONDARY FREQUENCY.

Probable circuit malfunction.
Refer to higher maintenance category.

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION

CAUTION

Limit any transmission to less than 10 seconds to avoid alerting a false search mission.

6. AN/PRC-90 OPERATES NORMALLY IN TEST SET, BUT DOES NOT OPERATE PROPERLY WITH ANTENNA CONNECTED.

Step 1. Broken antenna element or connector. Replace with antenna known to be good. Cleaning connecting surfaces.

Step 2. Intermittent open circuit. Refer to higher maintenance category.

Section V. MAINTENANCE OF AN/PRC-90

4-11. AVUM Maintenance Procedures (fig. 4-1)

a. Battery BA-1568/U

(1) Remove as follows:

(a) Unscrew (counterclockwise) watertight battery cover.

(b) Turn AN/PRC-90 upright and let battery drop out.

NOTE

If battery hangs up, remove with needle nose pliers and check all surfaces and contacts for leakage and/or corrosion. If contacts and container cannot be cleaned adequately, forward to higher maintenance category.

(2) Test Procedure:

(a) *General.* Battery Test Set TS-2530/UR with Battery Test Adapter MX-8801/PRC-90 or Battery Test Set TS-2530/UR are used to test Battery BA-1568/U. Refer to TM 11-6625-2631-14 for test set operating and maintenance instructions. Table 4-4 lists test set components. Figures 4-2 through 4-5 illustrate the test equipment and connecting parts.

NOTE

The TS-2530/UR and TS 2530A/UR contain data cards for other radios. Disregard inapplicable cards.

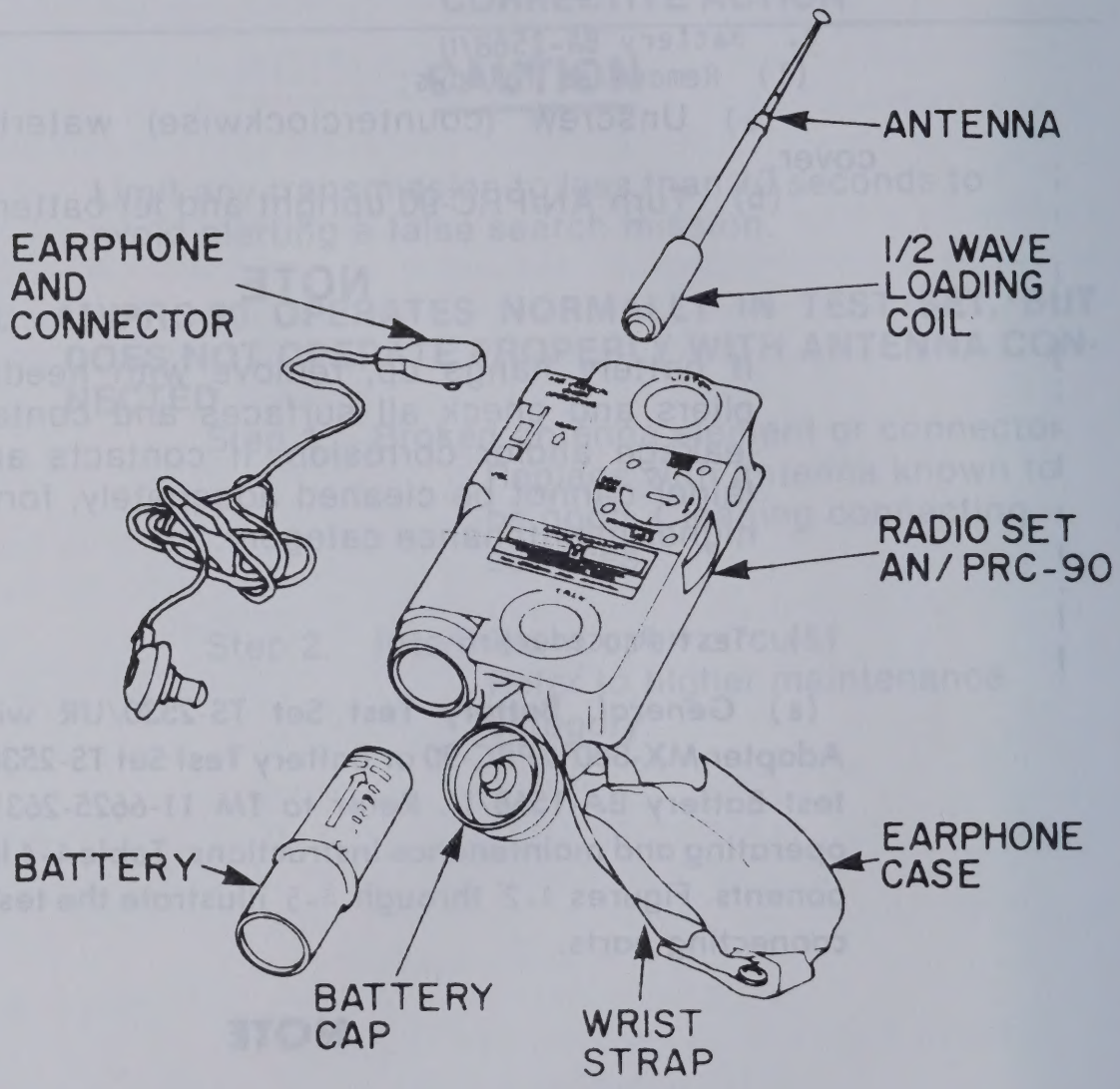


Figure 4-1. Radio Set AN/PRC-90, accessories removed.

Table 4-4. Items Comprising Battery Test Sets TS-2530/UR and TS-2530A/UR

Item	Qty	Dimensions (in.) Height	Depth	Width
Test Set, Battery TS-2530/UR consisting of:	1	5¼	5¼	4¼
TS-2530/UR instruction card	1			
PRC-90 data card (decal affixed to rear of instruction card)[a]				
Test Adapter, Battery MX-8801/PRC-90 (adapter cable length is 3 feet)[b]	1			

[a]PRC-90 data card is not to be used.
[b]Used with TS-2530/UR only.

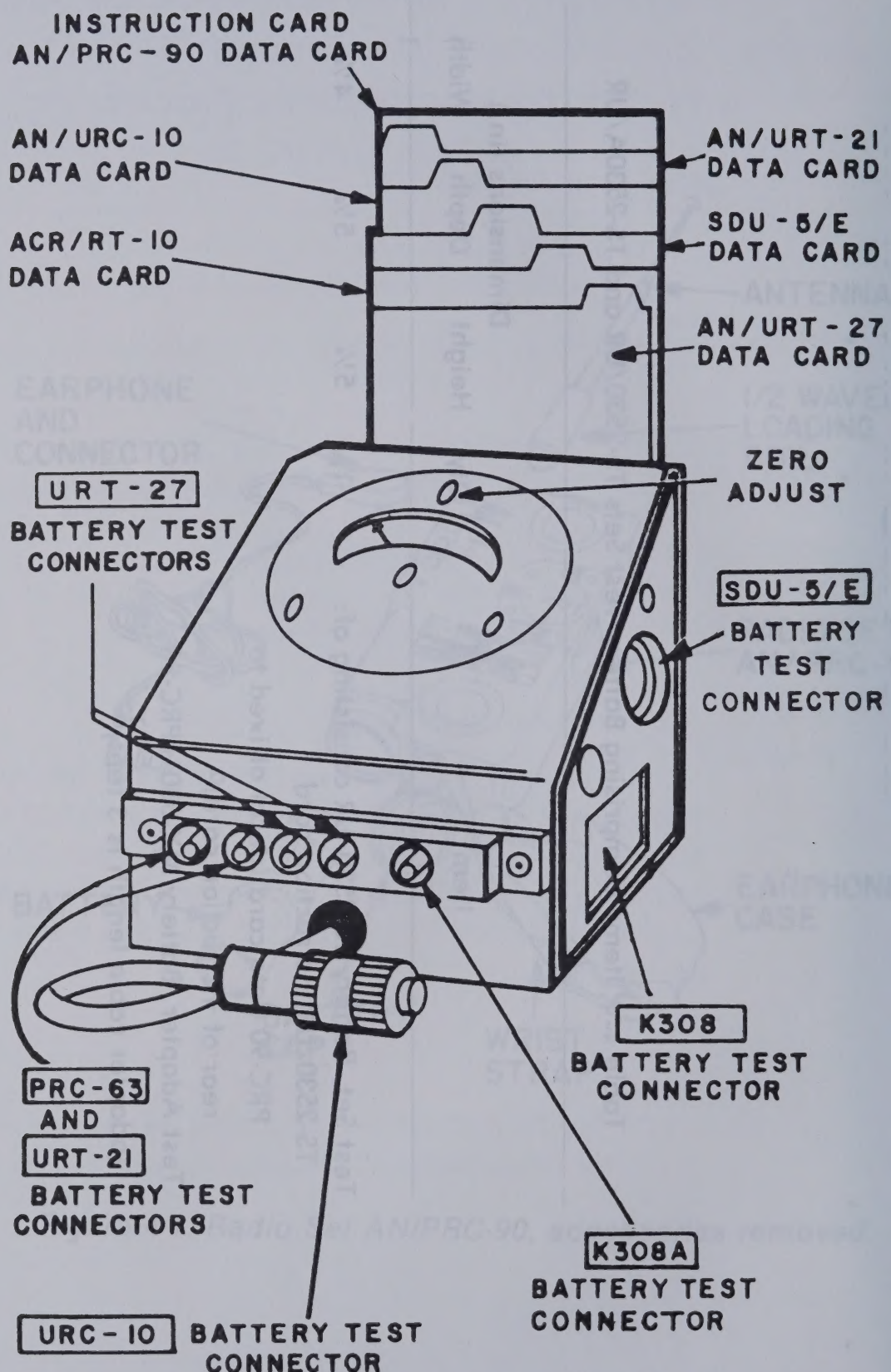


Figure 4-2. Battery Test Set TS-2530/UR

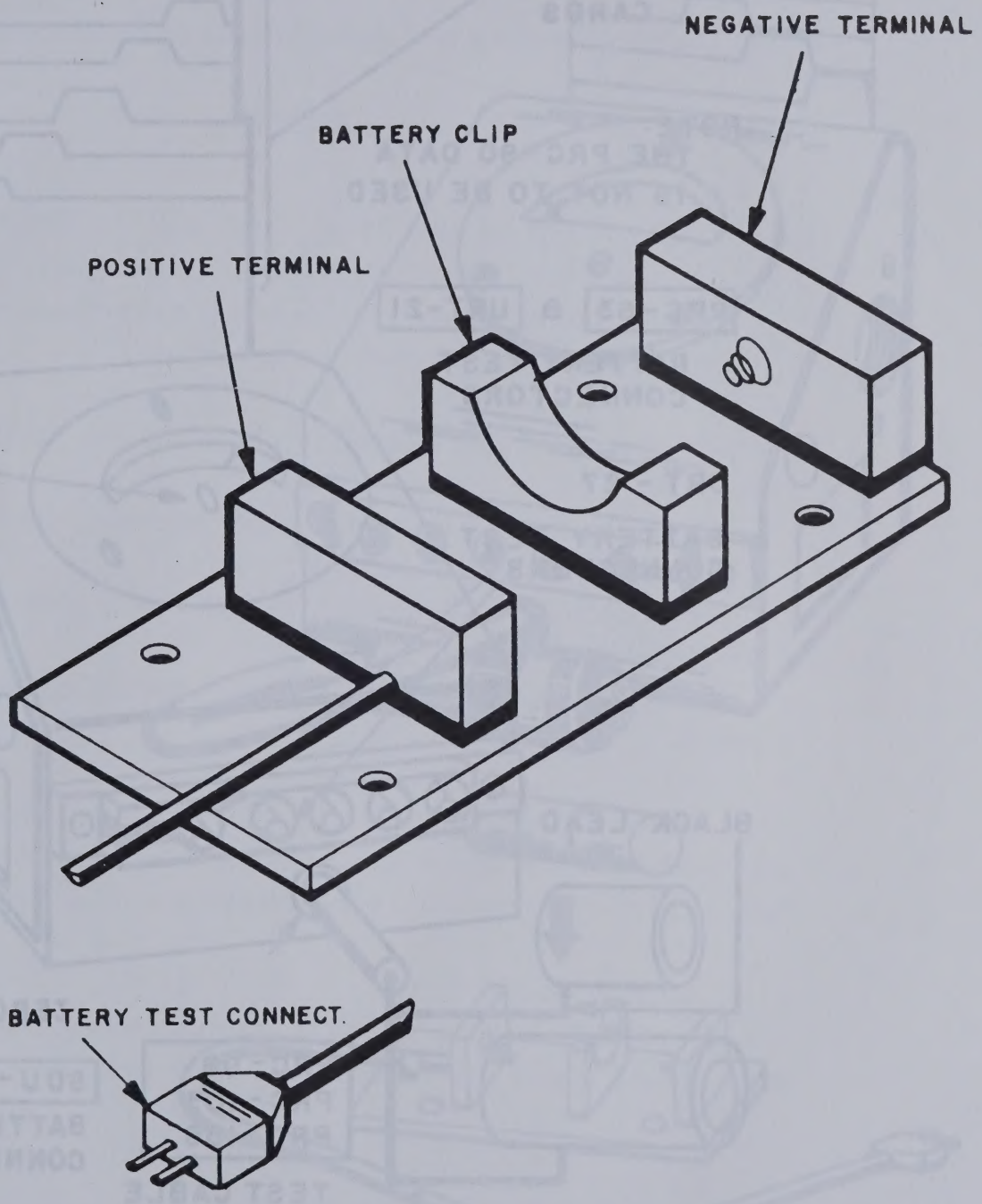


Figure 4-3. Battery Test Adapter MX-8801/PRC-90

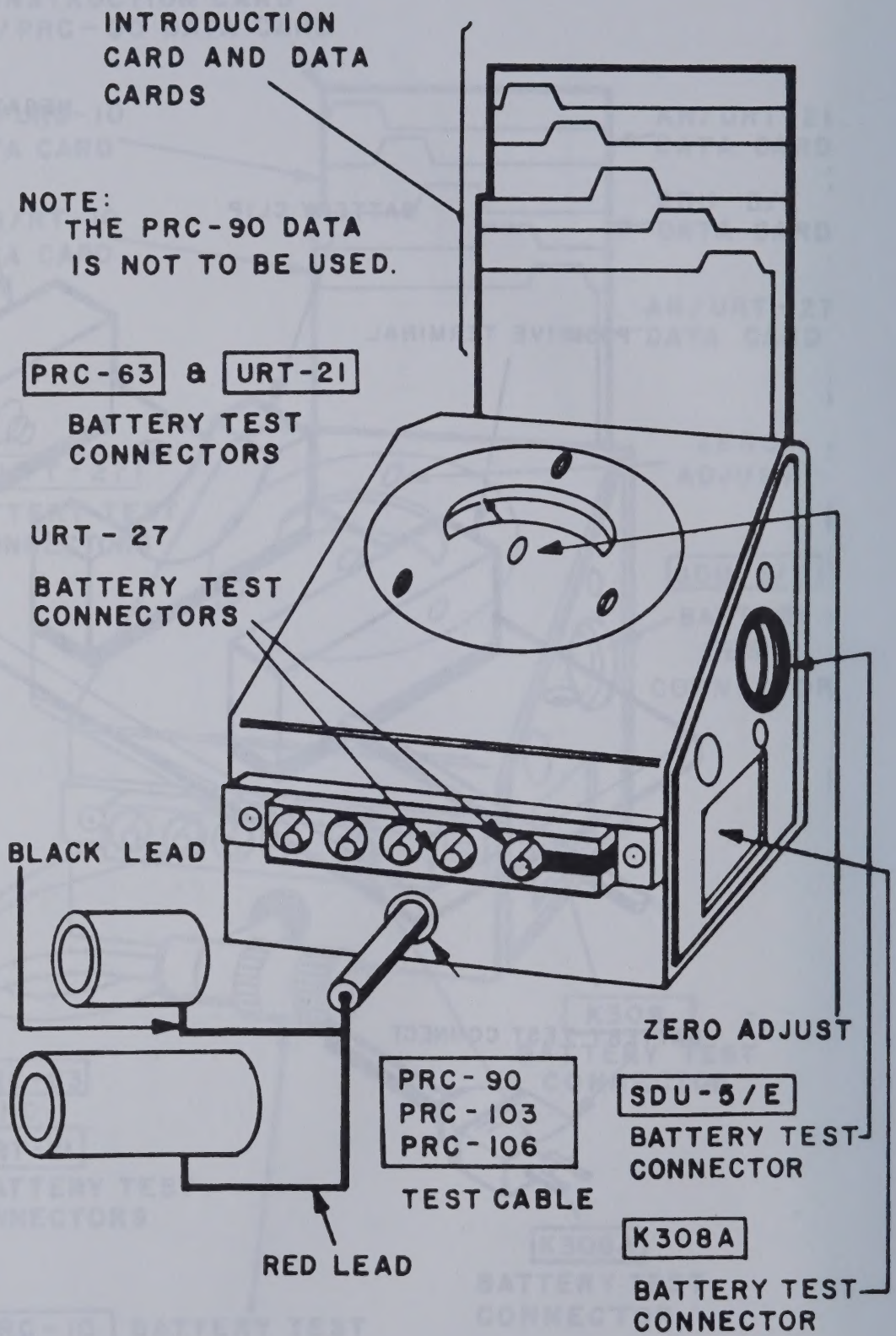


Figure 4-4. Battery Test Set TS-2530A/UR

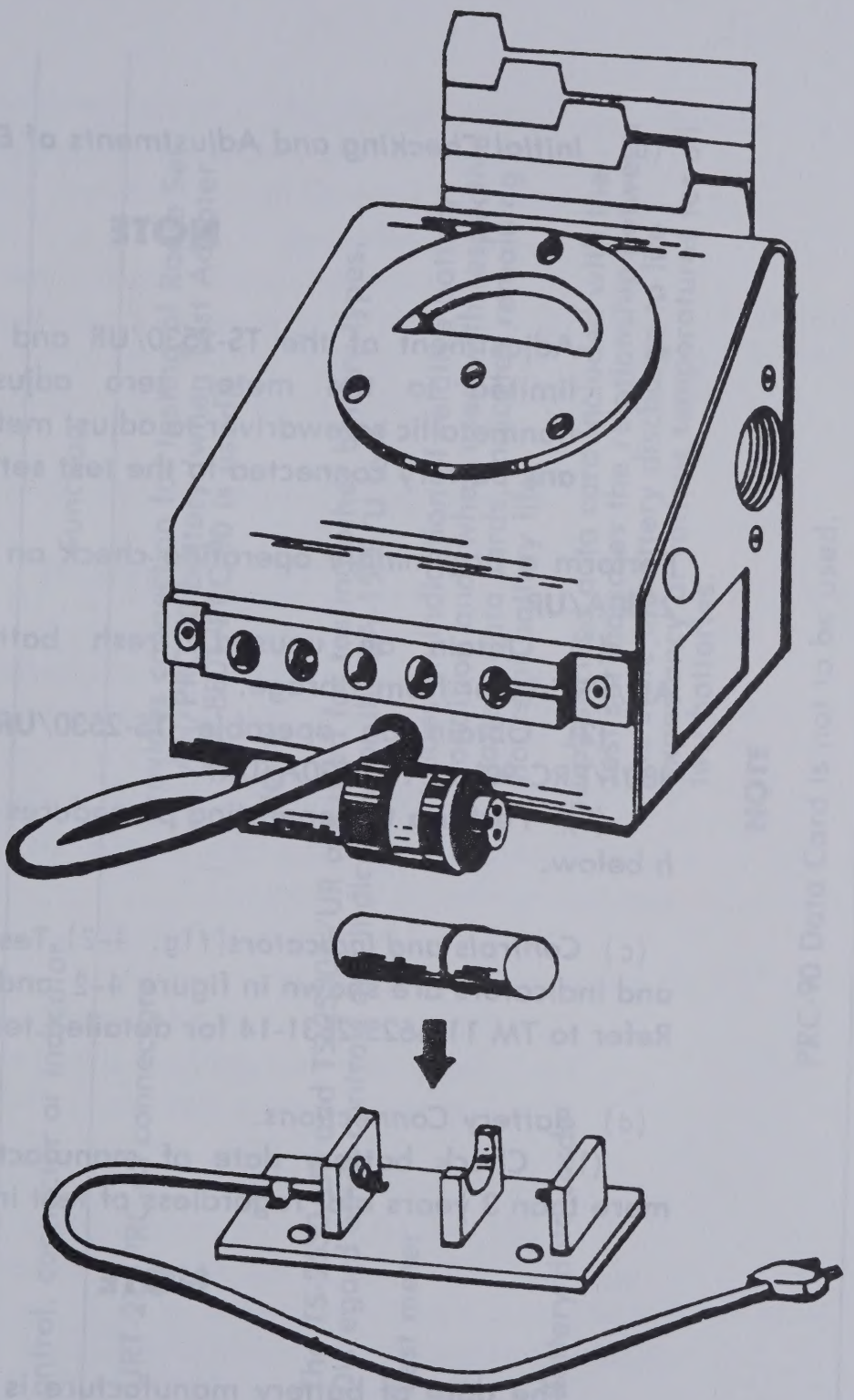


Figure 4-5. *Battery BA-1568/U(AN/PRC-90), test setup (TS-2530/UR only)*

(b) *Initial Checking and Adjustments of Equipment.*

NOTE

Adjustment of the TS-2530/UR and TS-2530A/UR is limited to the meter zero adjustment. Use a nonmetallic screwdriver to adjust meter zero, without any battery connected to the test set.

Perform a preliminary operation check on the TS-2530/UR or TS-2530A/UR.

(1) Obtain an unused, fresh battery from Radio Set AN/PRC-90 or from storage.

(2) Obtain an operable TS-2530/UR (with Adapter MX-8801/PRC-90) or TS-2530A/UR.

(3) Perform the operating procedures indicated in paragraph *h* below.

(c) *Controls and Indicators*(fig. 4-2).Test set operating controls and indicators are shown in figure 4-2 and described in table 4-5. Refer to TM 11-6625-2631-14 for detailed test set instructions.

(d) *Battery Connections.*

(1) Check battery date of manufacture. Discard batteries more than 3 years old, regardless of test indication.

NOTE

The date of battery manufacture is stamped on the battery casing and is abbreviated by a four-digit code number: the first two digits represent the month; the last two digits represent the year.

Table 4-5. Battery Test Set TS-2530/UR or TS-2530A/UR, Controls and Indicators (fig. 4-10 and 4-12)

Control, connector or indicator	Function
URT-21, PRC-63 connector	Provides connection for testing of Radio Set AN/PRC-90 battery (when Test Adapter MX-8801/PRC-90 is used).
	NOTE
	The TS-2530/UR and TS-2530A/UR are used for testing other battery types. Disregard other controls and indicators for the BA-1568/U test.
Test meter	Provides an indication of relative battery condition and, when used with respective battery data cards, indicates remaining hours of battery life.
Battery data cards	The plasticized data card included with the test set indicates the relationship between the state of battery discharge to life expectancy at various temperatures for all test batteries.
	NOTE
	PRC-90 Data Card is not to be used.

(2) For TS-2530/UR, connect the adapter leads to the battery test set connector block terminals designated PRC-63, with the male connector (red lead) to the + terminal; and the female lead (black lead) to the − terminal.

(3) Insert the battery in the adapter in accordance with the polarity markings. A typical test configuration for this battery is shown in figure 4-5.

(4) For TS-2530A/UR, connect the battery to the test cable.

(e) *Battery Test.* Perform the following steps.

CAUTION

Permanent damage may occur to the test set if battery polarity is not observed during test connections.

(1) After 5 minutes, observe the test meter reading. Meter readings below 0.74 indicate a weak BA-1568/U battery, and these batteries should be rejected.

(2) Reject battery if battery test indicates less than indication given in (1) above.

(3) Disconnect test adapter and battery (TS-2530/UR only).

(4) Disconnect test cable and battery (TS-2530A/UR only).

(5) Complete battery data card information.

(3) Replace as follows:

(a) Select a serviceable Battery BA-1568/U that has been checked and insert in the AN/PRC-90 battery enclosure.

CAUTION

Battery shape is such that it will only slip into the enclosure with proper polarity. Do not force the battery into place.

(b) Replace watertight cover (clockwise rotation). Tighten fingertight.

NOTE

If battery cover shows evidence of leaking, replace sealing washer in base of cap, or install new cap assembly. Refer to step b, below.

b. Replace wrist strap assembly as follows:

(1) Cut old strap assembly and remove all attaching parts. Dispose of worn parts and select new parts for reassembly.

(2) Attach battery cap, and battery cap retaining strap, and earphone case. Screw the battery cap onto the radio.

(3) Thread new strap through spaces between the radio case and the two cylindrical pins.

(4) Fold ends of wrist strap as shown in figure 4-2. Punch holes two places and apply a coat of varnish to prevent fraying. Allow to dry.

(5) Insert and swage grommets supplied with new wrist strap.

c. Antenna Assembly (fig. 4-7)

(1) Remove antenna as follows:

CAUTION

Do not attempt to loosen antenna by twisting; damaged antenna and seal may result.

Unscrew and remove antenna and sealing washer by hand.

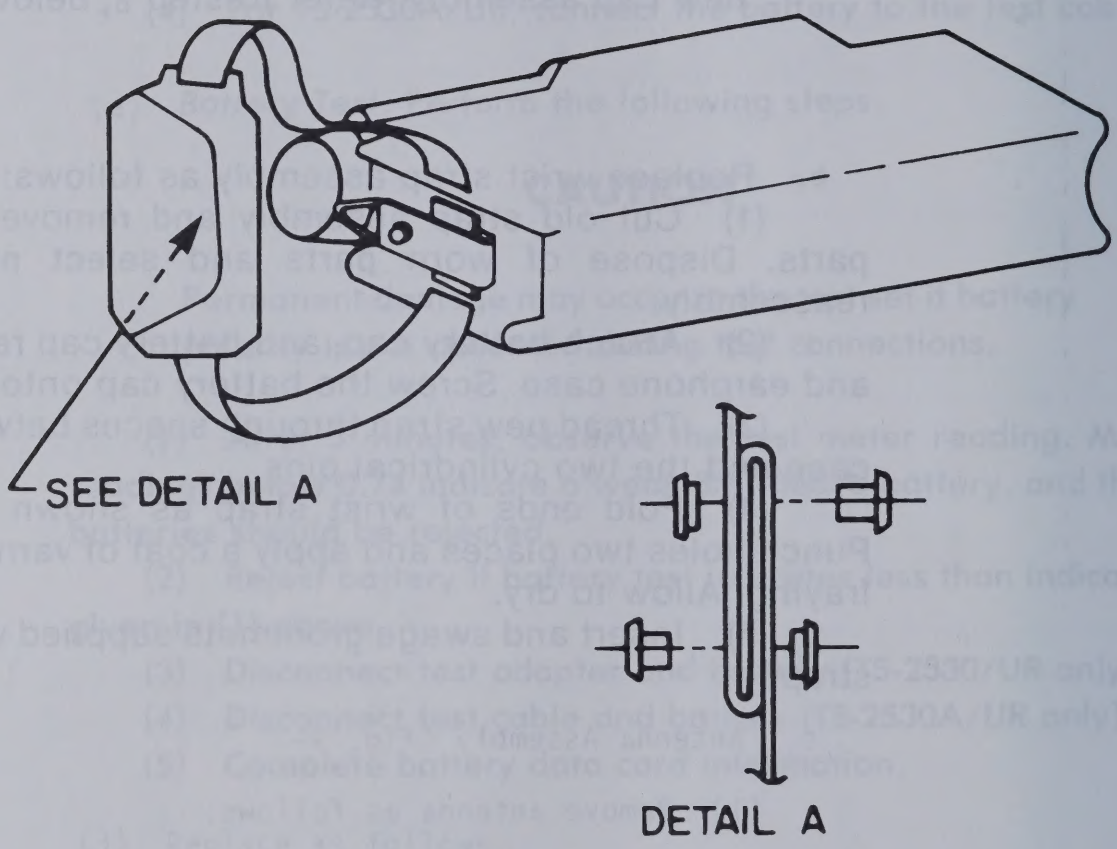


Figure 4-6. Wrist strap replacement detail.

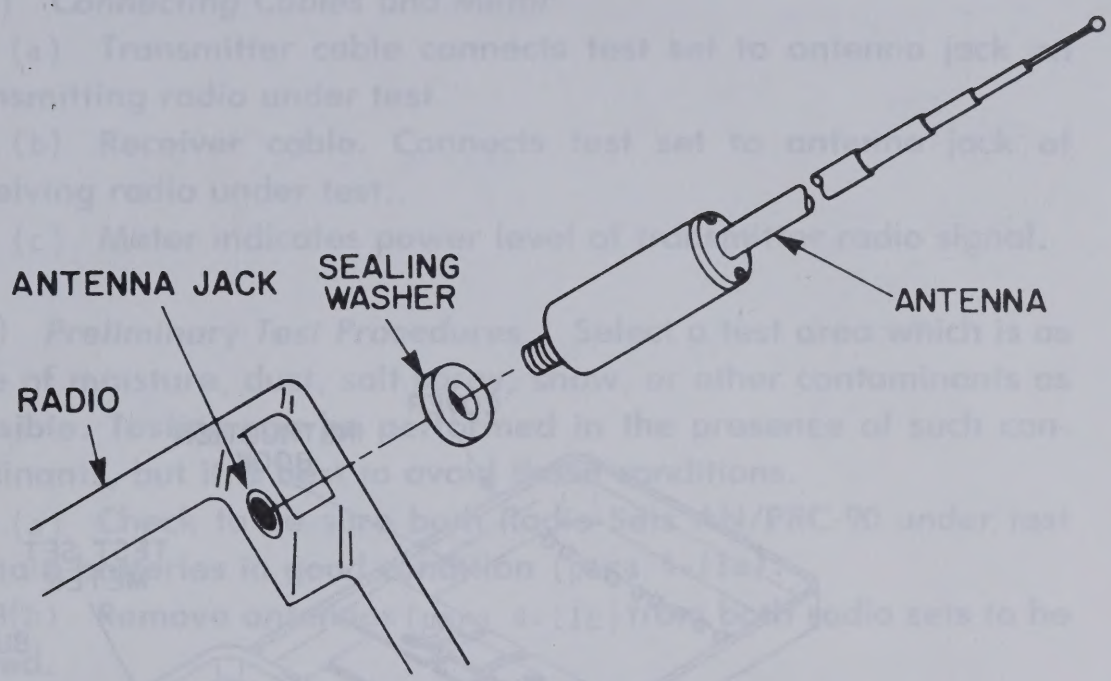


Figure 4-7. Antenna Removal from Radio Set AN/PRC-90.

CAUTION

Do not lose sealing washer.

(2) Replace antenna as follows:

(a) Place sealing washer over threads on antenna base.

(b) Screw antenna into antenna jack by hand (avoid cross threading).

d. Radio Test Procedure (fig. 4-8).

(1) General. Radio Test AN/PRM-32 is used to test Radio Set AN/PRC-90. The AN/PRM-32 has no control settings and serves only as a radio test link for testing AN/PRC-90 radios. It requires no special installation instructions, preliminary adjustments, external connections, or circuit alignments. Refer to TM 11-6625-2632-14 for a complete description of the AN/PRM-32.

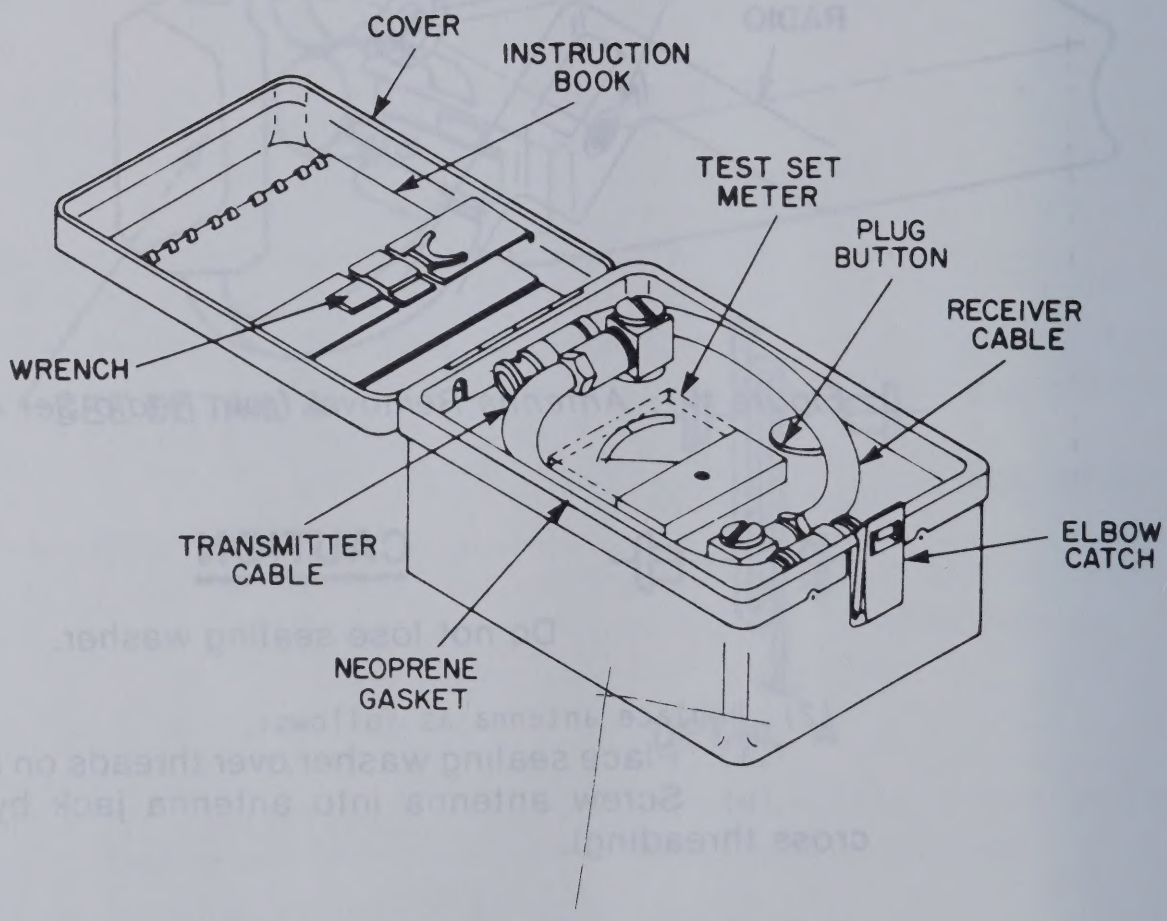


Figure 4-8. *Radio Test Set AN/PRM-32, Cover Open.*

(2) *Connecting Cables and Meter*

(a) Transmitter cable connects test set to antenna jack on transmitting radio under test.

(b) Receiver cable. Connects test set to antenna jack of receiving radio under test.

(c) Meter indicates power level of transmitter radio signal.

(3) *Preliminary Test Procedures.* Select a test area which is as free of moisture, dust, salt spray, snow, or other contaminants as possible. Testing can be performed in the presence of such contaminants, but it is best to avoid these conditions.

(a) Check to be sure both Radio Sets AN/PRC-90 under test contain batteries in good condition (para 4-11a).

(b) Remove antennas (para 4-11c) from both radio sets to be tested.

CAUTION

Do not lose sealing washer from antenna.

(c) Install a connector adapter (fig. 4-9) on each of the two radio antenna jacks. Avoid cross threading and seat connector adapters fingertight.

(d) Connect transmitter cable of test set to the connector adapter on one Radio Set AN/PRC-90 (transmitting radio), and connect receiver cable to the connector adapter on the other (receiving radio) (fig. 4-10)

e. *Beacon Monitor Check.*

(1) Set the function switch of the transmitting radio to the BCN 243.0 position.

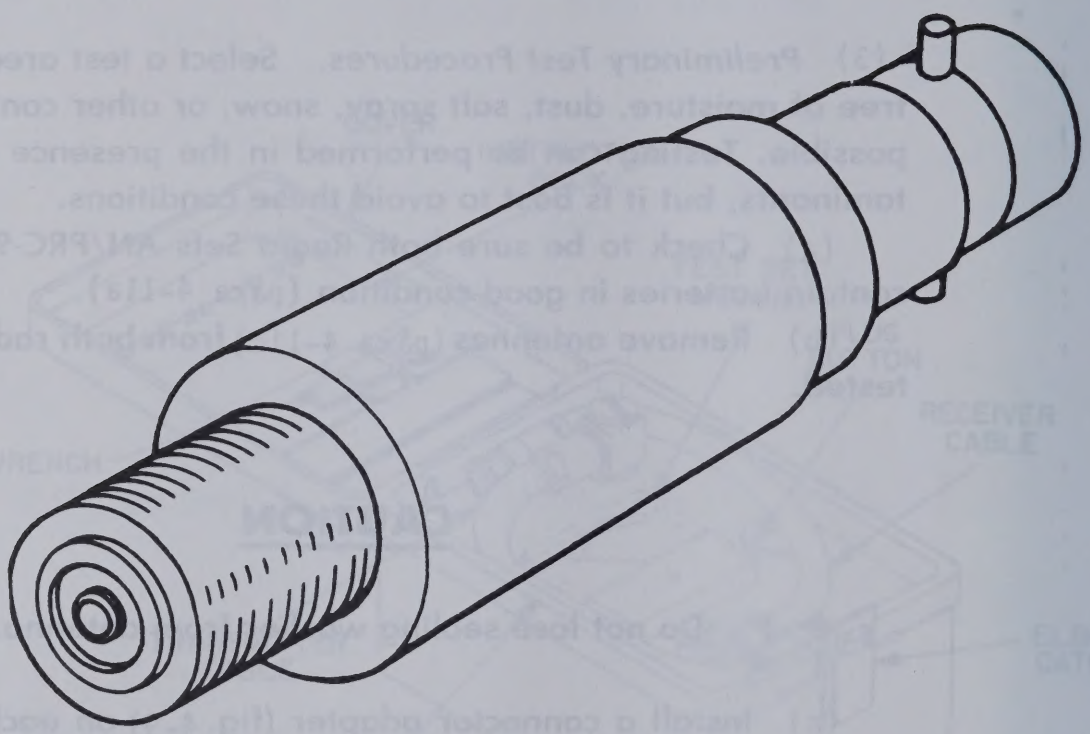


Figure 4-9. BNC Adapter MX-8802/PRC-90.

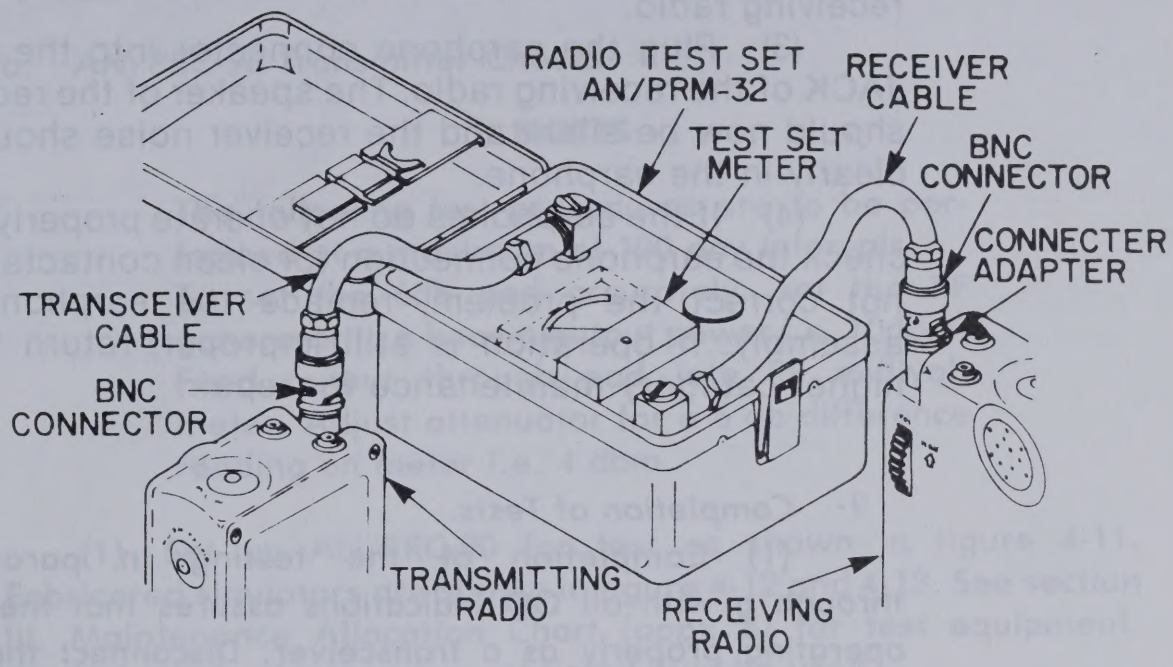


Figure 4-10. *Connection of test set radio under test.*

(2) A beacon tone should be barely audible from the speaker of the transmitting radio. If it is not, return the radio to higher category maintenance for repair.

f. Earphone Check.

(1) Using a transmitting radio known to be operating properly, set its function switch to the VOICE 282.8 position and its VOL control at minimum. Set the function switch of the receiving radio to the VOICE 282.8 position and its VOL control at MAX.

NOTE

To turn the knob of the function switch to the VOICE 282.8 position, press the button in the center of the knob while turning the knob in a counterclockwise direction.

(2) Observe the noise level from the speaker of the receiving radio.

(3) Plug the earphone connector into the EARPHONE JACK of the receiving radio. The speaker of the receiving radio should now be silent and the receiver noise should be heard clearly in the earphone.

(4) If the earphones do not operate properly ((3), above); check the earphone connection for clean contacts. If this does not correct the problem, replace the earphone and cord assembly. If operation is still improper, return the radio to higher category maintenance for repair.

g. *Completion of Tests.*

(1) Completion of the testing in paragraph 4-11d through *g* with all GO indications assures that the radio set is operating properly as a transceiver. Disconnect the transmitter cable and receiver cable and reconnect them with the radio sets reversed.

(2) Repeat the test procedures in paragraphs 4-11d, and f. If the testing is completed with all GO indications, both radio sets are operating properly as transmitters and as receivers.

(3) Disconnect the transmitter cable and receiver cable from the radio sets. Be sure the threads of the antennas and antenna jacks are free of moisture, dirt, or other contaminants. Install the antennas and antenna sealing washers. Avoid cross threading of the antennas.

(4) Disconnect the two connector adapters and place them in the test set. Stow the cables and close the cover.

NOTE

Test failures of several Radio Sets AN/PRC-90 in succession indicates a test equipment malfunction. Return Radio Test Set AN/PRM-32 to a higher category maintenance.

4-12. AVIM Maintenance Procedures

a. AN/PRC-90 Transmitter Checks.

NOTES

The following test procedures are to be performed at a maximum of 120 day intervals.
To set the 6db pad accurately, set the RF generator to a known output power i.e. 10dbm. Feed output through pad into RF millivolt meter. Adjust attenuator for a 6 db difference reading on meter i.e. 4 dbm.

(1) Set up AN/PRC-90 for test as shown in figure 4-11. Fabricated similators are shown in figure 4-12 and 4-13. See section III, Maintenance Allocation Chart (appx B) for test equipment. Equivalents for test equipment listed may be used.

(2) Place function switch on radio to 243.0 Voice/MCW.

(3) Adjust dc power supply to 12.0V $\pm$ 0.1V.

(4) Connect output of AN/PRC-90 to frequency counter through a 6db pad. Press PTT switch. Record transmitter frequency in table 4-6.

(5) Connect radio output to RF millivoltmeter through 6db pad. Press PTT switch. Record meter reading plus 6db in Power Out dbm UNMOD Column of table 4-6.

(6) Press MCW switch. Record meter reading plus 6db in Power Out dbm MCW Column of table 4-6.

(7) Rotate function switch on radio to BCN. Record reading plus 6db in Power Out dbm MOD Column of table 4-6.

(8) Adjust radio volume control to maximum. Read the sidetone output on oscilloscope. Record in table 4-6.

(9) Rotate function switch on radio to 282.8 Voice. Press PTT switch. Record reading plus 6db in Power Out dbm UNMOD Column of table 4-6.

(10) Press PTT switch and whistle into microphone. Record reading plus 6db In Power Out dbm MOD Column of table 4-6.

(11) Connect radio output to frequency counter. Press PTT switch. Record transmitter output frequency in Frequency MHz UNMOD Column of table 4-6.

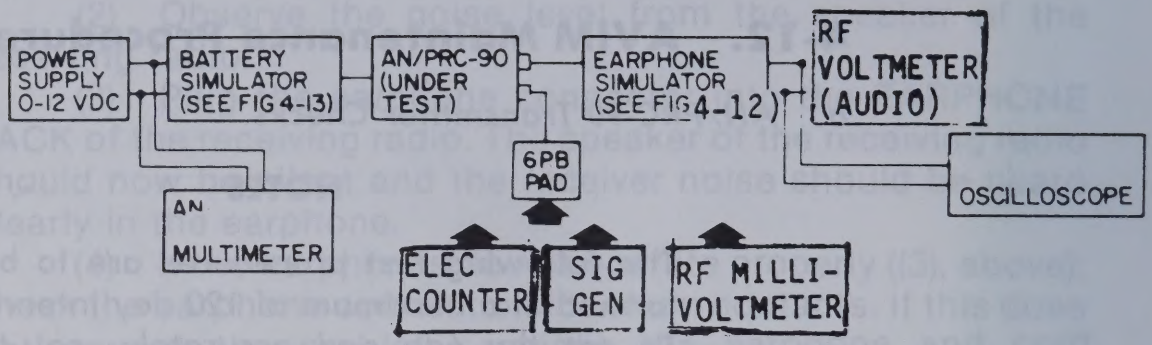


Figure 4-11. Test Set-up for RECV/XMR AN/PRC-90

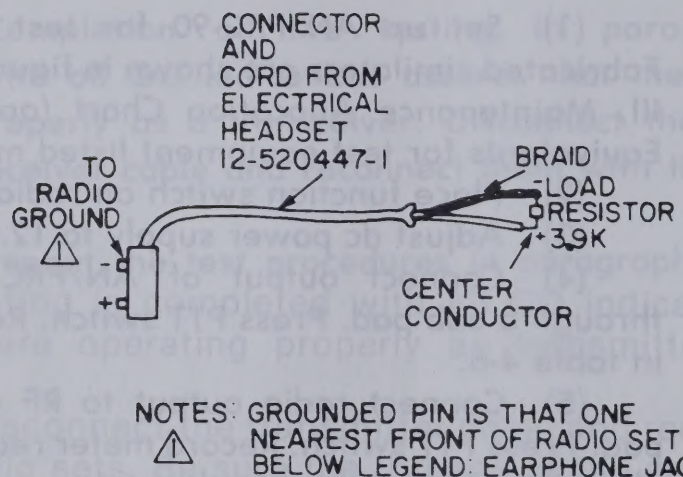


Figure 4-12. Earphone Simulator

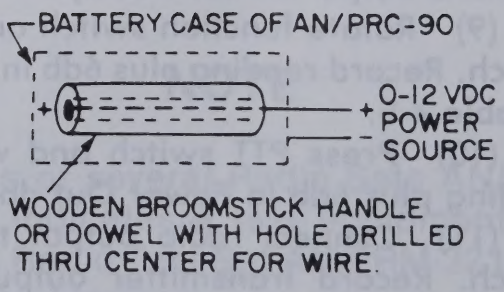


Figure 4-13. Battery Simulator

TABLE 4-6. TRANSMITTER TESTS

SWITCH FUNCTION	TEST	@12 VOLTS	LIMITS MIN.	@10 VOLTS	LIMITS MIN.
243.0	FREQUENCY MHz UNMOD		± 12.15 kHz		SAME
	POWER OUT dbm UNMOD		20.0 dbm		18.0 dbm
	POWER OUT dbm MCW		27.0 dbm		25.0 dbm
BCN	POWER OUT dbm MOD		27.0 dbm		25.0 dbm
	SIDE TONE VAC		0.2Vpp MIN 1.0V ppMAX		SAME

Table 4-6 Transmitter Tests - Continued.

282.8	FREQUENCY mHz UNMOD		± 14.14 kHz		SAME
	POWER OUT dbm UNMOD		18.0 dbm		16 dbm
	POWER OUT dbm MOD		25.5 dbm		23 dbm

(12) Readjust dc input power supply to 10.0V ± 0.1V. Perform steps 2 through 11. Record results in table 4-6.

b. Receiver Checks AN/PRC-90.

(1) Adjust dc power supply to 12.0V ± 0.1V.

(2) Set function switch on radio to 243.0 Voice/MCW. Adjust output of signal generator to 243.0 MHz ±5kHz. Use frequency counter to observe frequency. Adjust output of signal generator to 10 microvolts. Adjust to 1000 cycle and 30% modulation. Feed output through 6db to AN/PRC-90.

(3) Adjust the radio volume control to a point less than maximum, to avoid overloading the output audio amplifier. (An audio output voltage of 2.5 volts rms or 10 dbm prevents this overload.) From the RF voltmeter record reading in Signal and Noise Column of table 4-7.

(4) Remove modulation. Record noise level from RF voltmeter in Noise Column of table 4-7.

(5) Subtract the noise reading from the signal and noise reading and record the difference.

(6) Change AN/PRC-90 function switch to 282.8 Voice.

(7) Adjust output of signal generator to 282.8 MHz using the frequency counter for observation. Adjust signal generator for 10 microvolts, 1000 cycle and 30% modulation. Feed through 6db to radio. Adjust volume control of radio to 2.5V rms.

(8) Remove modulation. Record noise level from RF voltmeter in Noise Column of table 4-7.

(9) Subtract the Noise reading from the Signal and Noise reading and record the difference.

(10) Set volume control of radio for maximum. Reset signal generator to 1 kHz and 30% modulation. Read audio output on oscilloscope for a 3.0V pp minimum.

(11) Change AN/PRC-90 function switch to 243.0 Voice/MCW. Set signal generator to 243.0 MHz. Read audio output on oscilloscope for 3.0V pp minimum.

(12) Readjust dc power supply to 10V ± 0.1V. Repeat steps 2 through 11.

Table 4-7 Receiver Tests

FUNCTION		SIGNAL & NOISE	NOISE	DIFFERENCE	MINIMUM	MIN AUDIO OUTPUT (MAX VOL)
SWITCH	VOLTS					
243.0	12.0 V				6 db	3.0 vpp Min
243.0	10.0 V				6 db	3.0 vpp Min
282.8	12.0 V				6 db	3.0 vpp Min
282.8	10.0 V				6 db	3.0 vpp Min

Table 4-8 Correspondence Table for Decibels, Volts, and Watts (50Ω Load)

Decibels	Volts	Watts
+40dbw	709V	10,000W
+39dbw	633V	7,940W
+38dbw	563V	6,320W
+37dbw	501V	5,000W
+36dbw	447V	3,980W
+35dbw	399V	3,160W
+34dbw	355V	2,510W
+33dbw	317V	2,000W
+32dbw	282V	1,590W
+31dbw	252V	1,260W
+30dbw	224V	1,000W
+29dbw	200V	794W
+28dbw	178V	632W
+27dbw	159V	500W
+26dbw	141V	398W
+25dbw	126V	316W
+24dbw	112V	251W
+23dbw	100V	200W
+22dbw	89.1V	159W
+21dbw	79.5V	126W
+20dbw	70.9V	100W
+19dbw	63.3V	79.4W
+18dbw	56.3V	63.2W
+17dbw	50.1V	50.0W
+16dbw	44.7V	39.8W
+15dbw	39.9V	31.6W
+14dbw	35.5V	25.1W
+13dbw	31.7V	20.0W
+12dbw	28.2V	15.9W
+11dbw	25.2V	12.6W
+10dbw	22.4V	10.0W

Table 4-8 Correspondence Table for Decibels, Volts, and Watts (50Ω Load) - Continued.

Decibels	Volts	Watts
+9dbw	20.0V	7.94W
+8dbw	17.8V	6.32W
+7dbw	15.9V	5.00W
+6dbw	14.1V	3.98W
+5dbw	12.6V	3.16W
+4dbw	11.2V	2.51W
+3dbw	10.0V	2.00W
+2dbw	8.91V	1.59W
+1dbw	7.95V	1.26W
OdBw = +30dbw	7.09V	1.00W = 1000mW
+29dbm	6.33V	794mW
+28dbm	5.63V	632mW
+27dbm	5.01V	500mW
+26dbm	4.47V	398m W
+25dbm	3.99V	316mW

Decibels	Volts	Watts
+24dbm	3.55V	251mW
+23dbm	3.17V	200mW
+22dbm	2.82V	159mW
+21dbm	2.52V	126mW
+20dbm	2.24V	100mW
+19dbm	2.00V	79.4mW
+18dbm	1.78V	63.2mW
+17dbm	1.59V	50.0mW
+16dbm	1.41V	39.8mW
+15dbm	1.26V	31.6mW
+14dbm	1.12V	25.1mW
+13dbm	1.00V = 1000mV	20.0mW
+12dbm	891mV	15.9mW
+11dbm	795mV	12.6mW
+10dbm	709mV	10.0mW

APPENDIX A
REFERENCES

Following is a list of references available to AVIM/AVUM maintenance personnel of Radio Set AN/PRC-90:

DA Pam 310-1	Consolidated Index of Army Publications and Blank Forms.
DA Pam 738-750	The Army Maintenance Management System (TAMMS).
SB 38-100	Preservation, Packaging, Packing and Marking Materials, Supplies, and Equipment Used by the Army.
SC 5180-91-CL-R13	Sets, Kits, and Outfits Components List: Tool Kit, Electronic Equipment TK-101/G.
TB 43-180	Calibration and Repair Requirements for the Maintenance of Army Materiel.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11-6625-2631-14	Operator's Organizational, Direct Support, and General Support Maintenance Manual: Including Repair Parts and Special Tools List for Test Set, Battery TS-2530/UR (NSN 6625-00-933-6612).
TM 11-6625-2632-14	Operator's, Organizational, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tools List for Radio Test Set AN/PRM-32 (NSN 6625-00-808-3399).
TM 55-1680-317-23&P	Organizational and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Army Aircraft Survival Kit.
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronic Materiel to Prevent Enemy Use (Electronics Command).

APPENDIX B
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. MAINTENANCE ALLOCATION CHART.

a. This Maintenance Allocation Chart (MAC) assigns maintenance functions in accordance with the Three Levels of Maintenance Concept for Army Aviation. These maintenance levels (categories) Aviation Unit Maintenance (AVUM), Aviation Intermediate Maintenance (AVIM), and Depot Maintenance are depicted on the MAC as:

AVUM, which corresponds to an O Code in the Repair Parts and Special Tools List (RPSTL)

AVIM, which corresponds to an F Code in the Repair Parts and Special Tools List (RPSTL)

DEPOT, which corresponds to a D Code in the Repair Parts and Special Tools List (RPSTL)

b. The maintenance to be performed below depot and the field is described as follows:

(1) Aviation Unit Maintenance (AVUM) activities will be staffed and equipped to perform high frequency "On-Aircraft" maintenance tasks required to retain or return aircraft systems to a serviceable condition. The maintenance capability of the AVUM will be governed by the Maintenance Allocation Chart (MAC) and limited by the amount and complexity of ground support equipment (GSE), facilities required, authorized manning strength, and critical skills available.

(2) Aviation Intermediate Maintenance (AVIM) provides mobile, responsive "One-Stop" maintenance support. (Maintenance functions which are not conducive to sustaining air mobility will be assigned to depot maintenance.) AVIM may

perform all maintenance functions authorized to be done at AVUM. Repair of equipment for return to user will emphasize support or operational readiness requirements. Authorized maintenance includes replacement and repair of modules/components and end items which can be accomplished efficiently with available skills, tools, and equipment. AVIM establishes the Direct Exchange (DX) program for AVUM units by repairing selected items for return to stock when such repairs cannot be accomplished at the AVUM level. The AVIM level inspects, troubleshoots, performs diagnostic tests, repairs, adjusts, calibrates, and alines aircraft system modules/components. Unserviceable repairable modules/components and end items which are beyond the capability of AVIM to repair will be evacuated to Depot Maintenance.

B-2. USE OF THE MAINTENANCE ALLOCATION CHART (Sect. II).

NOTE

Nomenclatures used throughout the MAC are approved item names. Those terms/nomenclatures expressed in parentheses are generic in nature and are not to be considered as official terminology.

a. The Maintenance Allocation Chart assigns maintenance functions to the lowest category of maintenance based on past experience and the following considerations:

(1) Skills available.
(2) Work time required.
(3) Tools and test equipment required and/or available.

b. Only the lowest category of maintenance authorized to perform a maintenance function is indicated. If the lowest maintenance category cannot perform all tasks of any single maintenance function (e.g., test, repair), then the higher

maintenance level(s) that can accomplish additional tasks will also be indicated.

c. A maintenance function assigned to a maintenance category will automatically be authorized to be performed at any higher maintenance category.

d. A maintenance function that cannot be performed at the assigned category of maintenance for any reason may be evacuated to the next higher maintenance category.

B-3. MAINTENANCE FUNCTIONS.

Maintenance functions will be limited as follows:

a. Inspect
b. Test
c. Service
d. Repair

B-4. GROUP NUMBER AND COMPONENT/ASSEMBLY (Columns 1 and 2, Respectively).

a. Group Number (Column 1). Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Component/Assembly (Column 2). Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

B-5. MAINTENANCE FUNCTION (Column 3).

Column 3 lists the functions to be performed on the items listed in column 2.

B-6. MAINTENANCE CATEGORIES AND WORK TIMES (Column 4).

The maintenance categories (levels) AVUM, AVIM, and DEPOT are listed on the Maintenance Allocation Chart with individual columns that include the work times for maintenance functions at each maintenance level. Work time presentations such as "0.1" indicate the average time it requires a

maintenance level to perform a specified maintenance function. If a work item has not been established, the columnar presentation shall indicate " " Maintenance levels higher than the level of maintenance indicated are authorized to perform the indicated function.

B-7. TOOLS AND TEST EQUIPMENT (Column 5 and Section III).

Common tool sets (not individual tools), special tools, test and support equipment required to perform maintenance functions are listed alphabetically in Section III with a reference number to permit cross-referencing to column 5 in the MAC. In addition, the maintenance category authorized to use the device is listed along with the item National Stock Number (NSN) and, if applicable, the tool number to aid in identifying the tool/device.

B-8. REMARKS (Column 6 and Section IV).

Remarks (identified by an alphabetical code in column 6) and other notes (identified by a number in parentheses in the applicable column) are listed in Section IV to provide a ready reference to the definition of the remark/note.

SECTION II MAINTENANCE ALLOCATION CHART FOR RADIO SET AN/PRC-90

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARK
			AVUM	AVIM	DEPOT		
00	Radio Set Group AN/PRC-90	Inspect	0.1				
		Test	0.1			1-3,16	
		Test		1.0		1-16	A
		Service	0.1				
		Repair	0.2				B
		Repair			2.0		C

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR RADIO SET AN/PRC-90

TOOL OR TEST EQUIP. REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/ NATO STOCK NO.	TOOL NO.
1	AVUM, AVIM	RADIO TEST SET AN/PRM-32A	6625-01-013-9900	
		OR		
		RADIO TEST SET AN/PRM-32	6625-00-803-3399	
2	AVUM, AVIM	BATTERY TESTER TS-2530/UR	6625-00-933-6112	
		OR		
		BATTERY TESTER TS-2630A/UR	6625-00-238-0223	
3	AVUM, AVIM	BATTERY TEST ADAPTER MX-8801/PRC-90	6625-00-480-6315	
4	AVIM	VOLTMETER, ELECTRONIC AN/URM-1468	6625-00-973-3986	
5	AVIM	GENERATOR, SIGNAL AN/USM-44C	6625-00-138-7773	
6	AVIM	COUNTER, ELECTRONIC DIGITAL AN/USM-469	6625-01-061-8928	
7	AVIM	MULTIMETER AN/USM-451	6625-00-060-6804	
8	AVIM	MULTIMETER ME-268/U	6625-00-646-9409	
9	AVIM	OSCILLOSCOPE AN/USM-281C	6625-00-106-9622	
10	AVIM	POWER SOURCE (0-12VDC)	6130-00-985-8137	

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR RADIO SET AN/PRC-90. Continued.

TOOL OR TEST EQUIP. REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/ NATO STOCK NO.	TOOL NO.
11	AVIM	6P5 ATTENUATOR CN-1285/U	5985-00-454-6925	
		OR CN-1174/U	5985-00-491-4305	
12	AVIM	ANTENNA ADAPTER (FROM AN/PRM-32A)		
13	AVIM	EARPHONE SIMULATOR (SEE FIGURE 2)		
14	AVIM	BATTERY SIMULATOR (SEE FIGURE 3)		
15	AVIM	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5120-00-625-0079	
16	AVUM,AVIM	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5120-00-064-5178	

SECTION IV
REMARKS FOR MAINTENANCE ALLOCATION CHART FOR RADIO SET AN/PRC-90

REFERENCE CODE	REMARKS
A	Test is to be performed at 90-120 day intervals to verify condition and performance of Radio Set AN/PRC-90, using test procedures and specified test equipment. Test will also be performed on any radio considered defective (other than battery, antenna, or other external component damage) to pinpoint defect prior to return to depot.
B	AVUM repair is limited to replacement of external parts such as battery and antenna.
C	Defective Radio Sets should be forwarded to: Commander Transportation Officer Sacramento Army Depot Sacramento, CA 95801 M/F: Depot Stock Condition Code F Repair and overhaul shall be accomplished by the Air Force under DMISA.

APPENDIX C
ORGANIZATIONAL MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

C-1. Scope

This appendix lists repair parts and special tools required for the performance of organizational maintenance of the AN/PRC-90.

C-2. General

This Repair Parts and Special Tools List is divided into the following sections:

a. Section II - Repair Parts List. A list of repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending numerical sequence, with the parts in each group listed in figure and item number sequence.

b. Section III - Special Tools List. A list of special tools, TMDE, and support equipment authorized for the performance of maintenance at the organizational level.

c. Section IV - National Stock Number and Part Number Index. Not applicable.

C-3. Explanation of Columns

a. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item number.* The number used to identify each item called out in the illustration.

b. Source, Maintenance, and Recoverability Codes (SMR).

(1) *Source code.* Source codes are assigned to support items to indicate the manner of acquiring support items for

maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

Code *Definition*

PA - Item procured and stocked for anticipated or known usage.

PE - Support equipment procured and stocked for initial issue or outfitting to specified maintenance repair activities.

XD - A support item that is not stocked. When required, item will be procured through normal supply channels.

NOTE

Cannibalization or salvage may be used as a source of supply for any items source coded above except those coded XA, XD, and aircraft support items as restricted by AR 750-1

(1) *Maintenance code.* Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate the following level of maintenance:

Code *Application/explanation*

O - Support item is removed, replaced, used at the organizational level.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance func-

tions) This position will contain one of the following maintenance codes.

Code	*Application/explanation*
H	The lowest maintenance level capable of complete repair of the support item is the general support level.
Z	Nonreparable. No repair is authorized.

(3) *Recoverability Code.* Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Recoverability codes	*Definition*
Z	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.
L	Reparable item. Repair, condemnation, and disposal not authorized below depot/specialized repair activity level

c. National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

d. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

NOTE

When a stock numbered item is requisitioned, the repair part received may have a different part number than the part being repaired.

e. Federal Supply Code for Manufacturer (FSCM). The

FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. Description. Indicates the Federal item name and, if required, a minimum description to identify the item.

g. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g., ea, in, pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. Quantity Incorporated in Unit. Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly.

C-4. How to Locate Repair Parts

Not applicable.

C-5. Abbreviations

Not applicable.

Section II. Repair Parts List

(1) ILLUSTRATION (a) FIG NO.	(b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
			GROUP HEADER RADIO SET AN/PRC-90					
1	3	PAOZZ	5820-00-422-3081	05524-803-1	04655	Wrist Strap	EA	1
1	1	PAOZZ	5820-00-371-6806	03-000-01-001	52340	Antenna	EA	1
1	6	PAOZZ	5965-00-121-7569	12-520447	31487	Headset, Electrical	EA	1
1	2	PAOZZ	5965-00-497-1130	506630-1	04655	Case, Headset	EA	1
1	4	PAOZZ	5820-00-041-1352	89-524-802-1	04655	Battery Cap and Retainer	EA	1
1	5	PAOZZ	6135-00-838-0706	303654A	90303	Battery	EA	1
		PAOZZ	5330-00-928-7209	NAS1598-6R	80205	Washer, Sealing	EA	1
		PAOZZ	5360-00-151-5903	77-52478-1	04655	Spring, Helical	EA	1

Section III. Special Tools List

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
1	1	PEOH.L	6625-00-803-3399	01-524-930-2	04655	Special Tools Radio Test Set AN/PRM-32	EA	1
1	2	PEOH L	6625-00-933-6112	BT2	18560	Battery Test Set TS-2530/UR	EA	1
1	3	PEOZZ	6625-00-480-6315	89-524-848-1	04655	Battery Test Adapter MX-8801/ PRC-90	EA	1
1	4	XDOZZ		T1-04-0001	04655	Antenna Wrench, Spanner	EA	1

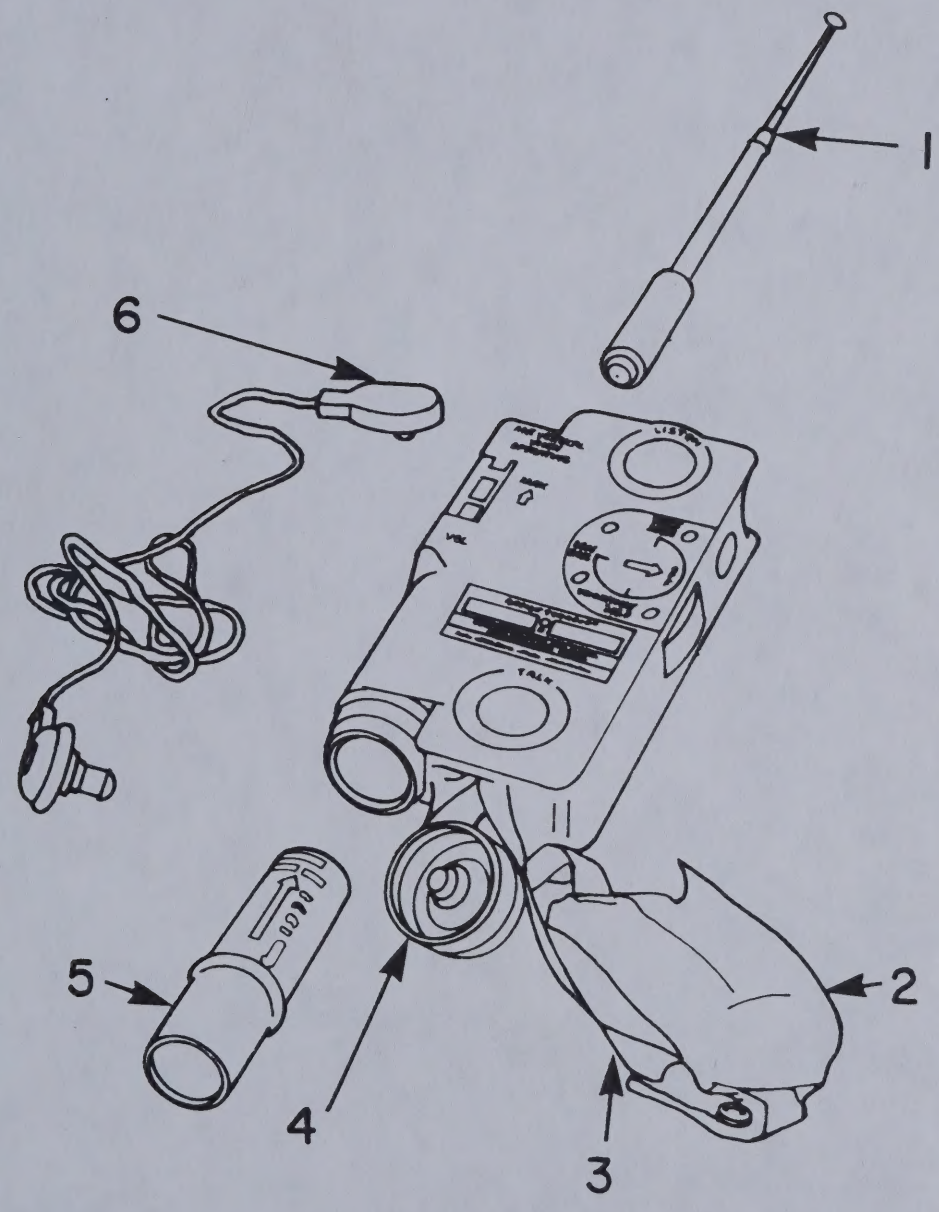
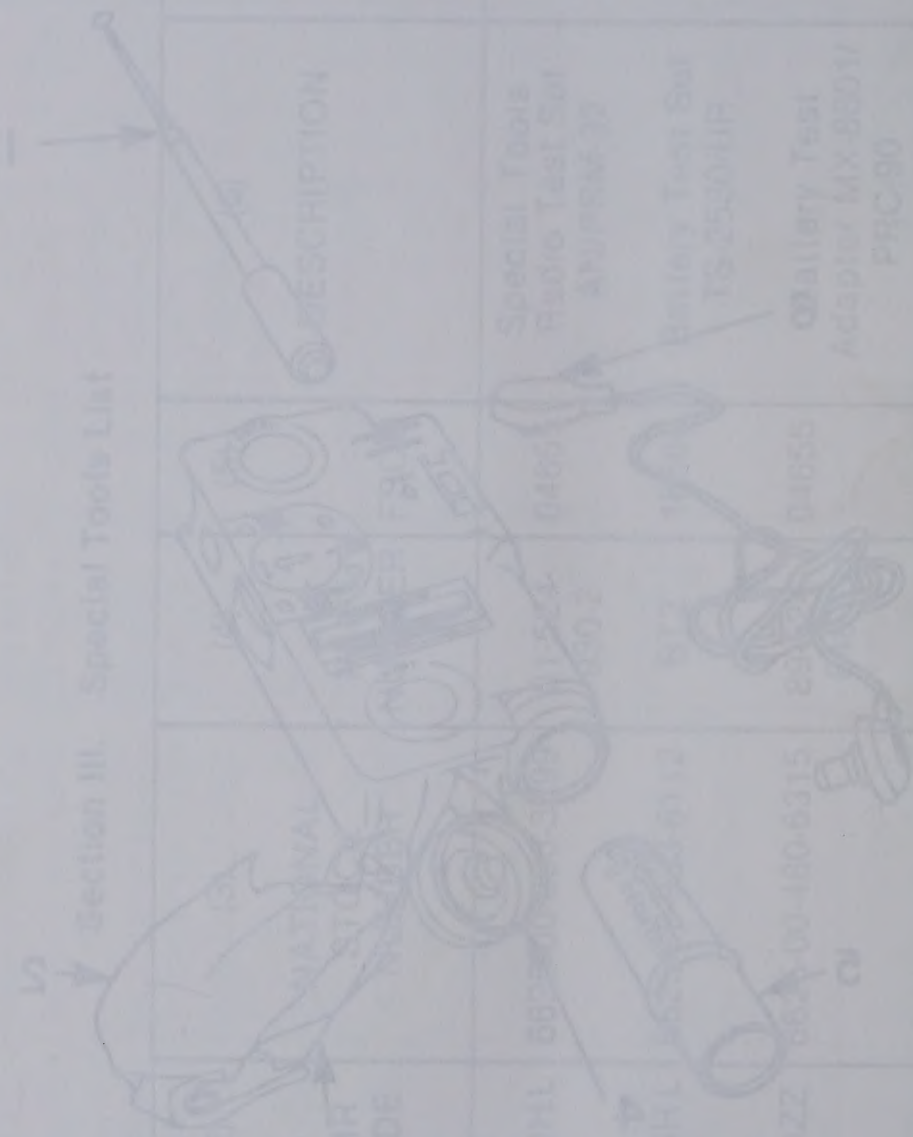


Figure 1. Radio Set AN/PRC-90.



TM 11-5820-800-13&P

TECHNICAL MANUAL

OPERATOR'S AVIATION UNIT AND INTERMEDIATE MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST)

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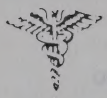
RADIO SET
AN/PRC-90

(NSN 5820-00-782-5308)

HEADQUARTERS, DEPARTMENT OF THE ARMY

5 MARCH 1985



5 SAFETY STEPS TO FOLLOW IF SOMEONE IS THE VICTIM OF ELECTRICAL SHOCK

1. DO NOT TRY TO PULL OR GRAB THE INDIVIDUAL
2. IF POSSIBLE , TURN OFF THE ELECTRICAL POWER
3. IF YOU CANNOT TURN OFF THE ELECTRICAL POWER, PULL, PUSH, OR LIFT THE PERSON TO SAFETY USING A WOODEN POLE OR A ROPE OR SOME OTHER INSULATING MATERIAL
4. SEND FOR HELP AS SOON AS POSSIBLE
5. AFTER THE INJURED PERSON IS FREE OF CONTACT WITH THE SOURCE OF ELECTRICAL SHOCK, MOVE THE PERSON A SHORT DISTANCE AWAY AND IMMEDIATELY START ARTIFICIAL RESUSCITATION

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUORETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

Technical Manual

No. 11-5820-800-13&P

HEADQUARTERS
DEPARTMENT OF THE ARMY
Washington, DC, 5 March 1985

OPERATOR'S AVIATION UNIT AND INTERMEDIATE MAINTENANCE MANUAL (INCLUDING REPAIR PARTS AND SPECIAL TOOLS LIST) RADIO SET AN/PRC-90 (NSN 5820-00-782-5308)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms) direct to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP, Fort Monmouth, NJ 07703-5007. In either case, a reply will be furnished direct to you.

Page

CHAPTER 1. INTRODUCTION 1-1
Section I. General 1-1
II. Description and Data 1-2

*This manual supersedes TM 11-5820-800-12, 30 November 1973, including all changes.

CHAPTER 2.		SERVICE UPON RECEIPT AND INSTALLATION	2-1
Section I.		Service Upon Receipt of Materiel	2-1
	II.	Installation	2-4
CHAPTER 3.		OPERATING INSTRUCTIONS	3-1
Section I.		Controls and Instruments	3-1
	II.	Operation Under Usual Conditions	3-4
	III.	Operation Under Unusual Conditions	3-11
CHAPTER 4.		MAINTENANCE INSTRUCTIONS	4-1
Section I.		Tools and Equipment	4-1
	II.	Repainting and Refinishing	4-2
	III.	Preventive Maintenance Checks and Services	4-5
	IV.	Troubleshooting	4-10
	V.	Maintenance of AN/PRC-90	4-13
APPENDIX A.		REFERENCES	A-1
	B.	MAINTENANCE ALLOCATION	B-1
Section I.		Introduction	B-1
	II.	Maintenance Allocation Chart	B-5
	III.	Tool and Test Equipment Requirements	B-6
	IV.	Remarks	B-8
	C.	ORGANIZATIONAL MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST	C-1
Section I.		Introduction	C-1
	II.	Repair Parts List	C-5
	III.	Special Tools List	C-6

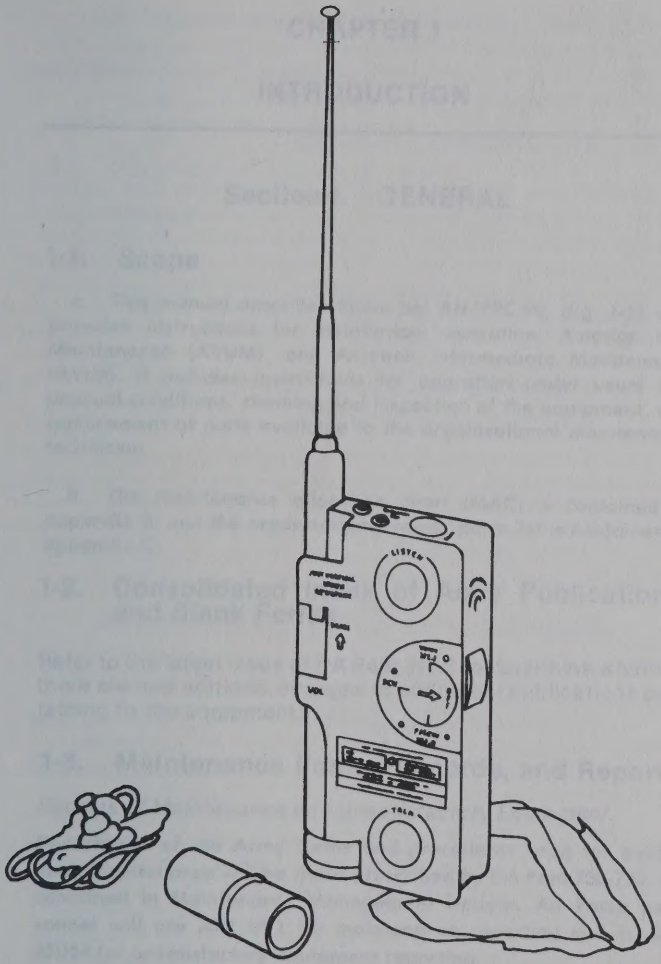
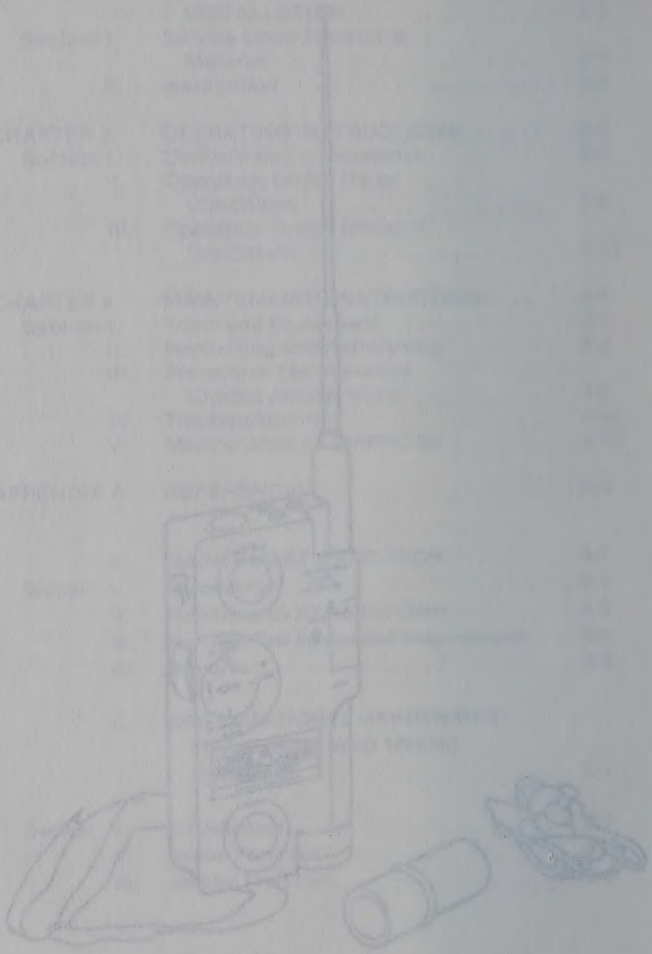


Figure 1-1. Radio Set AN/PRC-90.



CHAPTER 1

INTRODUCTION

Section I. GENERAL

1-1. Scope

a. This manual describes Radio Set AN/PRC-90, (fig. 1-1), and provides instructions for installation, operation, Aviation Unit Maintenance (AVUM), and Aviation Intermediate Maintenance (AVIM). It includes instructions for operation under usual and unusual conditions, cleaning and inspection of the equipment, and replacement of parts available to the organizational maintenance technician.

b. The maintenance allocation chart (MAC) is contained in appendix B; and the organizational repair parts list is contained in appendix C.

1-2. Consolidated Index of Army Publications and Blank Forms

Refer to the latest issue of DA Pam 310-1 to determine whether there are new editions, changes or additional publications pertaining to the equipment.

1-3. Maintenance Forms, Records, and Reports

Reports of Maintenance and Unsatisfactory Equipment.

Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA Pam 738-750, as contained in Maintenance Management Update. Air Force personnel will use AFR 66-1 for maintenance reporting and TO-00-35D54 for unsatisfactory equipment reporting.

1-4. Destruction of Electronic Material

Destruction of Army electronics materiel to prevent enemy use shall be in accordance with TM 750-244-2.

1-5. Administrative Storage

Administrative Storage of equipment issued to and used by Army activities will have preventive maintenance performed in accordance with the PMCS charts before storing. When removing the equipment from administrative storage the PMCS should be performed to assure operational readiness. Disassembly and repacking of equipment for shipment or limited storage are covered in paragraphs 2-2, 3-7, 3-8 and 4-7.

1-6. Reporting Equipment Improvement Recommendations (EIR)

If your radio set needs improvement, let us know. Send us an EIR. Let us know why you don't like the design. Put it on an SF 368 (Quality Deficiency Report). Mail it to: Commander, US Army Communications-Electronics Command and Fort Monmouth, ATTN: AMSEL-ME-MP Fort Monmouth, New Jersey 07703. We'll send you a reply.

Section II. DESCRIPTION AND DATA

1-7. Purpose and Use

a. Purpose. Radio Set AN/PRC-90 is an emergency locator transceiver to be used by aircrew members for communication with search and rescue ships, vehicles, or aircraft equipped with compatible radio equipment.

b. Use. Radio Set AN/PRC-90 is included as part of each survival package and may be issued to individuals when so directed by the commander. It provides modulated CW, beacon, or AM voice operation on 282.8 and 243.0 MHz, using a self-contained microphone and speaker (or earphone) and a detachable half-wave, base-loaded whip antenna. It is battery operated and cannot be recharged. Ground-to-air operation of up to 80 nautical miles and line-of-sight operation between

ground units of one-half to one mile can be assumed. Obstructions, earth minerals, antenna positioning, and atmospheric conditions will limit transceiver range.

c. Components. Repairable components for Radio Set AN/PRC-90 are listed in appendix B.

1-8. Technical Characteristics

a. General.

Frequency:	
Transmit	282.8 MHz (voice) 243.0 MHz (voice, mcw, and beacon
Receive	282.8 MHz ± 0.005% 243.0 MHz ± 0.005%
Frequency Stability	± 0.005%
Range:	
Ground-to-air (typical, with air craft at 10,000-foot alt.):	
Voice mode	60 nm
Beacon mode	80 nm
MCW mode	80 nm
ADF locator range	50 nm
Ground-to-ground	1 mile, line of sight, typical
Available channels	2
Channel spacing	39.8 MHz
Antenna	Half-wave, base-loaded, flexible whip; omnidirectional; vertically polarized.
Operating modes	Voice, mcw, and beacon.
Battery BA-1568/U:	
Type	14.0 volts, mercury alkaline.

Nominal voltage	12.0 volts
Operational voltage range	10.0 to 14.0 volts 100mA
Input current drain	40 ma, receive; transmit voice mode idle.
Battery life	14 hours maximum in beacon mode. 10 hours maximum in Voice/MCW mode. (1000 ma/hr at 70 ma.)
Battery Shelf Life	**3 years**
Dimensions (with battery, less earphone cartridge, straps, and antenna):	
Height	6 in.
Width	3 1/16 in.
Thickness	1 7/16 in.
Earphone case	2 7/8 by 1 1/4 in, cylindrical
Battery	1 by 3 in., cylindrical
Reliability	800 hours MTBF
Weight:	
Unit and earphone cartridge, less battery	14 oz.
Unit with earphone kit and battery	22 oz.

b. Transmitter.

Power output:	
Beacon and mcw mode	500 mw, PEP, minimum
Voice mode	400 mw, PEP, minimum
Frequency control	Quartz crystal, overtone
Modulation	80 percent, minimum
Harmonic Distortion:	
Normal battery	15%, maximum
Low battery	20%, maximum
Fidelity	+1,-3db through dynamic range (ref 1KHz)
Modulation Range:	
Voice Mode	500 to 3000 Hz

Beacon mode:	
Modulation type	AM
Frequency (rectangular waveshape)	300 to 1,000 Hz ±20% at 2 to 3 Hz rep rate and 5% retrace, maximum
Sweep direction	Downward
MCW mode:	
Modulation	AM
Frequency (rectangular waveshape	1000 Hz ±20%
Keying	Pushbutton
Sidetone	In beacon and mcw modes the speaker emits an audible, lowlevel sidetone.
Output impedance	50 ohms, unbalanced
Duty Cycle	100%
Ambient conditions:	
Elevation	40,000 feet above MSL
Explosive decompression	To 40,000 feet (5.54"Hg)
Humidity	90%, relative
Temperature:	
Storage	-60° to +60° C. (-76° to +140°F.)
Operating	-30° to +50°C. (-22° to +122°F.) (Excluding battery limits.)
Pressure (Salt water submersion limits):	
Short term (5 minutes)	50 feet, maximum
Long term (24 hours)	2 feet, maximum

c. Receiver.

Type	Super regenerative, AM
Tuning	Crystal Controlled

Sensitivity	5 microvolts, minimum for 6dB signal-plus-noise to noise ratio
Selectivity:	
Bandwidth at 450 KHz	Less than 6dB down from center frequency response.
Bandwidth at ± 10 MHz	At least 60 db down
Local oscillator radiation	Limited to permit two (2) sets to operate within at least 10 feet separation with less than 1.0 db signal degradation.
Audio frequency response	500 to 3000 Hz; + 2, -5db (ref 1KHz)
Audio output:	
Voice	0 to 22 mw, variable
Beacon and mcw (side-tone)	3.52 to 8.8 mw, fixed

1-9. Items Comprising Radio Set AN/PRC-90 (fig. 1-1)

The items in table 1-1 make up an operational Radio Set AN/PRC-90. One copy of this manual is packed with each AN/PRC-90.

Table 1-1. Items Comprising Radio Set AN/PRC-90

NSN	Item	Quantity	Dimensions H	W	D	Weight
5820-00-782-5308	Radio Set AN/PRC-90	1	8¼	6½	3¼	1.5lb
5820-00-371-6806	Antenna	1				
6135-00-838-0706	Battery, BA-1568/U	1	3	1	1	
5820-00-041-1352	Battery Cap and Retainer	1				
5965-00-121-7569	Headset, Electrical	1				
5965-00-497-1130	Case, Headset	1	3	2	2(cyl)	
5820-00-422-3081	Wrist Strap	1				
5360-00-151-5903	Helical Spring	1				
5330-00-928-7029	Washer Sealing	1				

1-10. Description of Equipment (fig. 1-1)

a. Radio Set AN/PRC-90 is a small emergency transceiver contained in a moisture resistant cast aluminum enclosure. Its working controls and accessory connections assure protection against high-altitude decompression, landing shocks, submersion in salt water, and exposure to extremes in atmospheric conditions.

b. An earphone is included in an attached polyvinyl container for use when the speaker output is not desired.

c. Transceiver operating modes can be selected by rotating the function switch. Supplementary control is through a watertight mcw (code) pushbutton. In the voice mode, speaker or earphone volume can be varied by the VOL control with an arrow indicating the maximum-volume position.

d. The battery can be removed by unscrewing a watertight cap on the lower corner.

e. The unit is normally packaged with the antenna attached and bent around the unit to conserve space. Telescoping antenna, fully extended, is broadbanded and presents a nominal impedance of 50 ohms.

f. A copy of the manual is included in a watertight container for operator assistance.

g. The unit is finished in a dull olive drab, baked-enamel finish with white-enamel-filled etched labels near controls.

CHAPTER 2

SERVICE UPON RECEIPT AND INSTALLATION

Section I. SERVICE UPON RECEIPT OF MATERIEL

2-1. General

The AN/PRC-90 is a small battery operated radio transceiver which is used by downed airmen as an emergency locator beacon transmitter and can be used for voice or code (MCW) transmission and reception. It requires minimum service assuming normal maintenance. No systems planning or physical installation procedures are required. Service upon receipt is performed by organizational maintenance personnel.

2-2. Unpacking (fig. 2-1)

Radio Set AN/PRC-90 and the technical manual are enclosed in a cushioned watertight container within a corrugated fiberboard carton for shipment to organizational level.

CAUTION

If conditions permit, remove any salt water accumulations from packing container before opening to prevent corrosion. Do not open the AN/PRC-90 transceiver case except for battery access.

a. Cut away sealing tape and remove the AN/PRC-90 and technical manual packet.

b. Remove battery from its container

2-3. Checking Unpacked Equipment

NOTE

Inspection of equipment must be performed by organizational or higher category maintenance personnel. This section is not applicable to service operation.

a. Inspect the overall condition of the equipment. Check for fractures, dents, scratches, or missing parts (fig. 1-1 and 2-1).

b. Check contents against packing slip or refer to table 1-1.

c. Check controls on unit. Microswitch operation can be heard when the MCW or PUSH TO TALK buttons are pressed. Operate the mode/OFF switch and VOL control for evidence of malfunction. Check to see that antenna is clean and snaps to the erect position when released from the stowed position. Check telescoping sections for proper operation or bent sections. Check to see that identification and code plates are clean and legible.

NOTE

Some antennas have a loose-fitting cover which may appear twisted or wrinkled. The antenna is not defective unless the rubber is cracked or broken.

d. Check for presence of battery and report presence of any corrosion in battery enclosure.

e. Report any discrepancies in accordance with TM 38-750 (para 1-3).

f. If the equipment has been used or reconditioned, see whether it has been changed by a modification work order (MWO). If the equipment has been modified, the MWO number will appear on the face of the AN/PRC-90 or near the nomenclature plate. If modified, see that any operational or maintenance instruction changes resulting from the modification have been entered in the equipment manual.

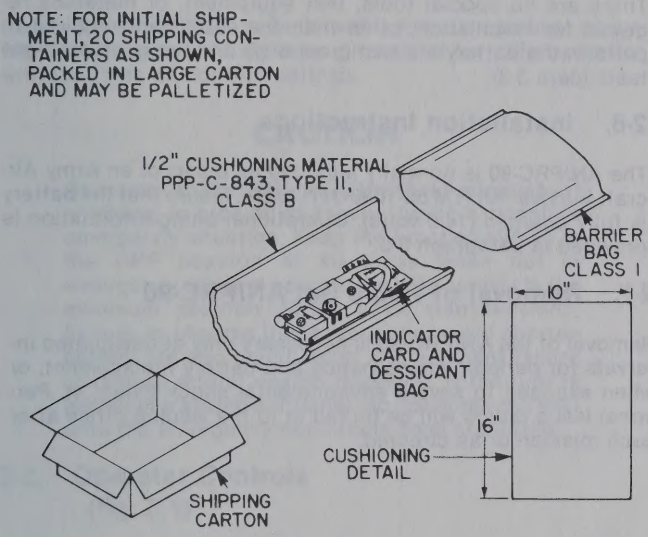


Figure 2-1. Radio Set AN/PRC-90, shipping container detail.

Section II. INSTALLATION

2-4. General

The AN/PRC-90 is provided in a simplified packaging and operational arrangement. Siting is covered in paragraph 3-5. No shelter or systems planning procedures are necessary.

2-5. Tools, Test Equipment, and Materials Required for Installation

There are no special tools, test equipment, or materials required for installation, other than the equipment required to perform the battery life test (para 4-12) and the radio preflight tests (para 3-3).

2-6. Installation Instructions

The AN/PRC-90 is normally included as a part of an Army Aircraft Survival Kit (TM 55-1680-317-23&P). Insure that the battery is fully charged (14.0 volts). Operational siting information is provided in paragraph 3-5.

2-7. Removal of Radio Set AN/PRC-90

Removal of the AN/PRC-90 is necessary only at designated intervals for periodic maintenance and battery replacement, or when exposed to severe environmental shock (chap. 4). Personal issue radios will be turned in to the issuing office after each mission or as directed.

CHAPTER 3

OPERATING INSTRUCTIONS

Section I. CONTROLS AND INSTRUMENTS

3-1. Equipment Damage and Warnings (fig. 3-1)

Radio Set AN/PRC-90 is built with ultimate operator convenience as a goal and includes provisions for safe operation without limits on control settings.

CAUTION

Operation of the AN/PRC-90 without adequate rf shielding is prohibited except during a bonafide emergency situation. Keep the function switch in the OFF position at all times when not in emergency use and operate the VOL control in the minimum position during voice transmissions. Failure to observe these precautions will shorten battery life and could result in equipment failure or disrupt actual search missions. If the unit is issued in a sealed container, do not break the seal until the emergency conditions have stabilized.

3-2. Operator Controls (fig. 3-1)

Controls and connectors for the AN/PRC-90 are shown in table 3-1.

Table 3-1. Controls, Indicators, and Connectors

Controls, Indicators, and Connectors	*Function*
Function switch	Selects transceiver operating mode and turns set off (para 3-4).
Function switch arrow/ pushbutton.	Indicates operating mode and locks out 282.8 MHz unless depressed.
MCW pushbutton, sealed . .	Activates microswitch which provides modulated CW output on 243.0 MHz.
PUSH TO TALK push-button.	Permits simplex voice transmission on 282.8 or 243.0 MHz.
VOL/MAX control	Adjusts LISTEN speaker output level only in VOICE or VOICE/MCW modes.
LISTEN disc	Sealed speaker button.
TALK disc	Sealed microphone button.
EARPHONE connectors . . .	Waterproof, unbalanced output for earphone.
Battery cover	Watertight, negative-ground battery cover.
Front and rear identification and instruction labels.	Front label identifies the radio set and manufacturer. Rear labels include set OPERATING INSTRUCTIONS and 36 alphanumeric characters and corresponding MCW (modulated) CW Morse code pulse groups.

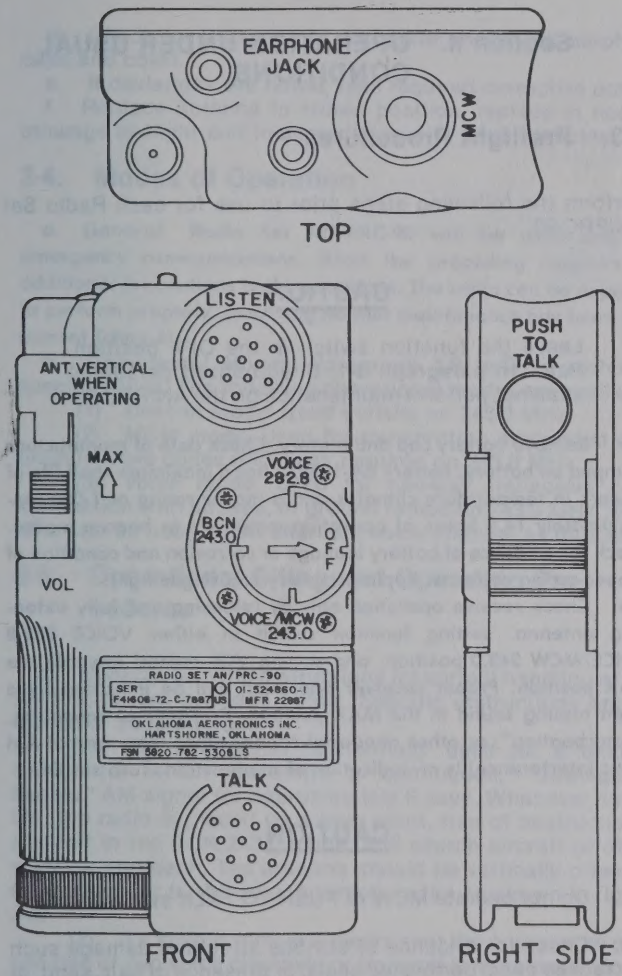


Figure 3-1. Radio Set AN/PRC-90, controls and indicators.

Section II. OPERATION UNDER USUAL CONDITIONS

3-3. Preflight Procedures

Perform the following steps prior to use for each Radio Set AN/PRC-90.

CAUTION

Leave the function switch in the OFF position. Refer to paragraph 3-1. Unauthorized personnel shall not perform maintenance on the AN/PRC-90.

a. Remove battery cap and battery. Check date of manufacture stamped on battery. Battery BA-1568/U has a maximum shelf life of 3 years in temperature climates and a ma/hr rating of 1,000 (approximately 14.3 hours of operation maximum in beacon mode). Check for evidence of battery leakage or corrosion and condition of copper spring contacts. Replace battery cap finger tight.

b. Check receive operation only by releasing and fully extending antenna, setting function switch in either VOICE 282.8 VOICE/MCW 243.0 position, and setting VOL control towards the MAX position. Proper receiver operation will be indicated by a slight hissing sound in the MAX position. Presence of squealing, "motorboating", or other abnormal sound (other than normal AM static interference) is an indication of malfunction. Turn set OFF.

CAUTION

Do not operate MCW or PUSH TO TALK switches.

c. Check for evidence of obvious structural damage such as cracked case, perforated seals, or presence of salt, sand, or oil accumulations.

d. Check for presence of earphone and check earphone case and cover.

e. If deviations are noted, take required corrective action.

f. Replace antenna in stored position, replace in normal stowage or flight suit in accordance with latest directives.

3-4. Modes of Operation

a. General. Radio Set AN/PRC-90 will be used only for emergency communications. Read the preceding chapters for additional precautions and instructions. The radio can be expected to perform properly, assuming normal maintenance has been kept current (chap.4).

b. Operational Modes. Paragraph 1-8 defines technical specifications. The following operational modes are available:

(1) *Beacon mode.* Used initially on 243.0 MHz.

(2) *MCW mode.* Used for transmitting modulated continuous wave codes (MCW) as required on 243.0 MHz.

(3) *Voice mode.* Used for two-way transceive communication with air, sea, or ground radios on 243.0 MHz. 282.0 MHz can be used as an alternate voice channel as directed.

3-5. Operational Siting and Operating Procedures

a. General. General instructions for correct handling of the AN/PRC-90 are provided below. Specific instructions are included in subparagraph *b.*

(1) The AN/PRC-90 is normally used as a beacon transmitter which transmits a continuous, "down-going beeper" AM signal for approximately 6 days. Whenever possible, the radio is placed on a high point, free of obstructions, and left in the BCN 243.0 mode until search aircraft or other vehicles approach. The antenna should be vertically oriented (perpendicular to the search vehicle radio) as shown in figure 3-2.

(2) If a search vehicle appears near the operator he may use one of two voice channels or transmit international Morse Code (MCW) to communicate with the search vehicle.

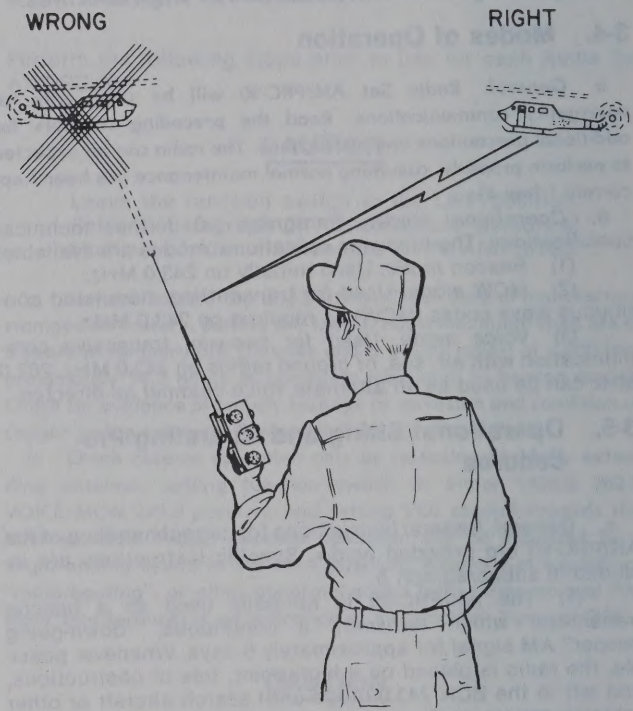


Figure 3-2. Antenna orientation.

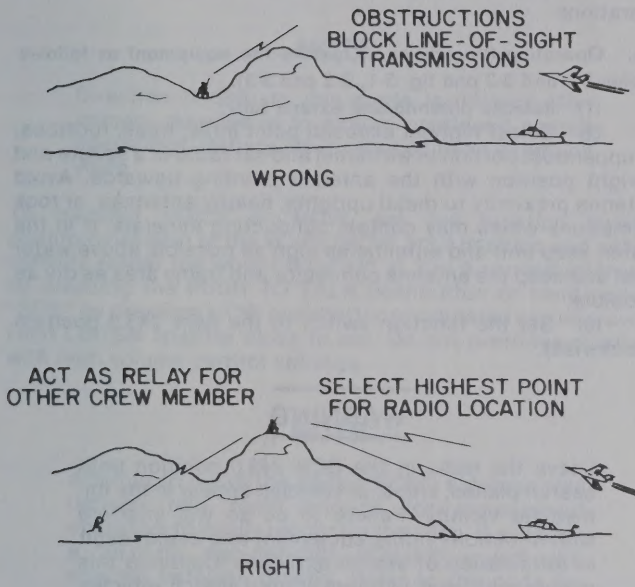


Figure 3-3. Operational siting under search mission conditions.

(3) When informed that a firm location has been determined, the radio can be used to communicate with other crewmen to join forces for recovery operations.

(4) If the radio is being used for tactical operations only, use the earphone when enemy forces are near enough to hear the speaker. Keep transmissions brief in all tactical operations.

b. Operating Procedures. Operate the equipment as follows (tables 3-1 and 3-2 and fig. 3-1, 3-2 and 3-3).

(1) Release antenna and extend fully.

(2) Select highest exposed point (hills, trees, rooftops, or uppermost portion of airframe) and set radio in a secure and upright position with the antenna pointing upwards. Avoid antenna proximity to metal uprights, nearby antennas, or rock formations which may contain conducting minerals. If in the water, keep unit and antenna as high as possible above water level and keep the antenna connector and frame area as dry as possible.

(3) Set the function switch to the BCN 243.0 position (clockwise).

WARNING

Leave the radio in the BCN 243.0 position until search planes, ships, or vehicles appear in the immediate vicinity. Failure to do so will interfere with direction-finding equipment and could result in termination of search activities. Continue this mode for at least 14 hours or until search vehicles are contacted. Battery and beacon failure is indicated by loss of beacon sidetone in the speaker (or earphone). If more than one AN/PRC-90 is available, use only one at a time and share batteries to extend the transmission period.

(4) Prior to visual contact with search craft, and if reasonable doubt exists as to proper beacon operation, occasional brief voice or mcw ("Mayday" or "SOS") transmissions can be made. Limit such transmissions to daylight hours for

best propagation. Follow a 2-minute-on, 1-minute-off; 3-minute-on, 2-minute-off; and 10-minute-on procedure. Make the "Mayday" and/or "SOS" transmissions once just after sunrise, once at noon, and once near sundown to take advantage of improved propagation. Meteorological conditions will affect transmission range and quality.

NOTE

Direction finding in this mode is difficult. The primary purpose is to ensure continued search operations. Battery life is reduced to an extent by voice.

To transmit VOICE or MCW, set the function switch counterclockwise to the VOICE/MCW 243.0 position and either verbally repeat the word "Mayday" at 2 or 3 second intervals by pressing the PUSH TO TALK pushbutton or send coded "SOS" by pressing MCW pushbutton (modulated carrier wave). Hold LISTEN speaker close to ear. Do not overdrive speaker with high volume control settings.

NOTE

Attempt to make the code ("SOS") sidetone well defined and rapid enough for experienced operators to easily recognize the code. It will have a "di-di-dit, dah-dah-dah, di-di-dit" sound with spacing between groups. Refer to the code explanation on the rear panel.

(5) If reasonable doubt exists that the 243.0 MHz transmitter is functioning, set the function switch to the VOICE 282.8 position and transmit speech only as described in step (4) above.

NOTE

The function arrowhead button must be pressed to release the switch for 282.8 MHz operation.

(6) Repeat steps (1), (2) and (3) above.

(7) When a rescue craft is within sight, call the rescue radio operator as follows. Turn the function switch clockwise to the VOICE/MCW 243.0 position and use the calling procedure outlined in table 3-2. Press the PUSH TO TALK button and speak in a normal voice near the microphone during transmissions. Do not shout. This procedure will result in a more intelligible transmission. Place the VOL control in a position that provides adequate audio volume from the speaker (or earphone).

NOTE

Widely separated crewmen may be making simultaneous transmissions. Rescue operator will assign transmission to avoid carrier heterodyne interference on the same channel or advise switching the function switch to the alternate channel (VOICE-282.8). If contact is broken, return to the VOICE/MCW 243.0 position and repeat step (7).

(8) Leave controls set for voice operation until rescue personnel are within speaking distance or otherwise ordered.

3-6. Stopping Procedure

When the requirement for radio transmissions is past, turn the function switch to the OFF position and place the radio in its stowage compartment.

Table 3-2. Recommended Voice Operating Practices

Originating Call AN/PRC-90	*Probable Reply*
"CQ rescue craft, CQ,CQ,CQ. Over."	None or "Roger, roger, roger." Read you five by five (or other signal report).
If no reply received, continue to call "CQ" on voice or MCW at intervals until reply is received.	
"Roger, roger. Crew status follows. Over." (Report crew physical status, missing crew members, and any emergency logistics or medical requirements.)	"Roger. Your transmission understood. Standby for reply. Out." (Or other pertinent reply.)
"Roger. Out."	

Section III. OPERATION UNDER UNUSUAL CONDITIONS

3-7. Operating and Storage Limitations

a. Operation of the AN/PRC-90 will span a wide range of weather normally at temperatures of -30° to +50° C. (-22° to +122° F.) and may be stored at from -60° to +60° C. (-76° to +140° F.).

NOTE

Battery will not operate below 0°C.

b. Equipment operated at low temperatures should be kept in low temperature storage when not in use. Store the equipment in a shipping carton and cover the carton with water-repellent material.

c. When the equipment is to be operated at freezing temperatures, perform the following procedure before operating the equipment.

(1) Remove battery and keep it warm.

(2) Use water-repellent material (SB 38-100) to cover the shipping carton during periods of high humidity.

3-8. Operation in Desert and Tropical Areas

a. Desert Regions. Before using the equipment in desert regions, remove all sand and dust. Blow and shake sand out of speaker and microphone.

b. Tropical Regions. In climates of high humidity, such as tropics, inspect the equipment daily for fungus, mold, insects, and metallic corrosion.

CAUTION

Do not open the AN/PRC-90 case chassis. Only higher category maintenance personnel may work on components. Opening the case will permit moisture and dust to enter the unit, resulting in a possible malfunction.

3-9. Operation in Maritime, High Altitude, or Rainy Areas

Keep the AN/PRC-90 in a dry area if possible. Avoid rigging any cover materials near the antenna in salt atmosphere. Watch for accumulations of salt between the antenna base and the radio. Remove any fouling sediment to assure proper operation. No special procedures are required for high-altitude operation.

3-10. Recognition and Identification of Jamming

Under tactical conditions, the AN/PRC-90 may be jammed by the enemy. This jamming may be planned or accidental and will usually be caused by a strong signal transmitted on the same frequency as that being used. The signal being transmitted may be a steady carrier or a modulated carrier. When it becomes difficult or impossible to receive the desired signal, switch the function switch to the alternate voice channel or revert from the voice to the mcw mode and attempt cw contact.

CHAPTER 4

MAINTENANCE

Section I. TOOLS AND EQUIPMENT

4-1. General

The purpose of this chapter is to provide instructions enabling maintenance personnel to test, troubleshoot, and repair the radio set and thereby ensure its serviceability. Except for certain accessible and necessarily replaceable components, such as straps, some switches, volume control, housing, and covers which are field replaceable, the majority of internal electrical repair is performed by depot.

4-2. Repair Parts and Special Tools List

a. Repair Parts. See Table 1-1, page 1-7.

b. Special Tools. No special tools are required with the exception of the small spanner wrench furnished with Radio Test Set AN/PRM-32.

4-3. Special Test Equipment

a. Radio Test Set AN/PRM-32 (NSN 6625-00-803-3399).

OR

Radio Test Set AN/PRM-32A (NSN 6625-01-013-9900).

b. Battery Tester TS-2530/UR (NSN 6625-00-933-6112).

OR

Battery Tester TS-2530A/UR (NSN 6625-00-238-0223).

c. Battery Test Adapter MX-8801/PRC-90 (NSN 6625-00-480-6315).

d. Tool Kit, Electronic Equipment TK-101/G (NSN 5180-00-064-5178).

4-4. Materials Required for Organizational Maintenance

a. Trichlorotrifluoroethane (cleaning compound) (NSN 6850-00-105-3084).

b. Camel's-hair brush (NSN 8020-00-242-9625).

c. Lint free cloth (NSN 8305-00-170-5062).

d. Fungus removal solution (NSN 6850-00-133-0695).

e. Lens tissue (NSN 6640-00-393-2090).

f. Sandpaper, fine (NSN 5350-00-264-3485) (or pencil eraser).

g. Mild acid solution (boric acid solution or vinegar).

h. Paint, olive drab.

i. Paint, white.

j. Varnish.

Section II. REPAINTING AND REFINISHING INSTRUCTIONS

4-5. Cleaning

a. Brush dirt and dust from the exterior surfaces of the AN/PRC-90 with a camel's-hair brush and a clean, lint-free cloth.

b. If any mildew or fungus is present, moisten a clean, lint-free cloth in the fungus removal solution and rub the area until the fungus is removed. Dry the area with a dry, clean, lint-free cloth.

c. Remove dust or dirt from control surfaces with a brush.

d. Remove rust and corrosion from metal surfaces by lightly sanding them with fine sandpaper or rubbing with an abrasive eraser.

e. Clean battery enclosure and contacts with mild ascetic solution (boric acid or vinegar) followed by clear water rinse. Burnish with pencil eraser or equivalent.

WARNING

Adequate ventilation should be provided while using TRICHLOROTRIFLUOROETHANE. Prolonged breathing of vapor should be avoided. The solvent should not be used near heat or open flame; the products of decomposition are toxic and irritating. Since TRICHLOROTRIFLUOROETHANE dissolves natural oils, prolonged contact with skin should be avoided. When necessary, use gloves which the solvent cannot penetrate. If the solvent is taken internally, consult a physician immediately.

f. Remove grease and ground-in dirt from the exterior surfaces of the case with a cloth dampened (not wet) with trichlorotrifluoroethane. Allow to dry out thoroughly.

g. If the radio set has been exposed to salt water or if such exposure is suspected because of difficulty in operating the function switch, wash the radio set in fresh water. To do this, immerse the entire radio in a basin of fresh water and agitate while operating the function switch. If repeated fresh water washings do not free the function switch, send the radio set to field maintenance for dissassembled cleaning or replacement of the function switch.

4-6. Repainting and Refinishing

a. Perform cleaning procedure outlined in paragraph 4-5.

b. Sand as required to prepare a smooth surface, using No. 400 wet or dry paper. Remove dust and repeat step 4-5*f*.

c. Brush two coats of primer on bare metal surfaces. Use enough thinner to avoid pileups. Allow to dry thoroughly between coats.

d. Apply two thin coats of OD paint (No. 24081, MIL-STD-595) evenly to all exterior surfaces. Allow to dry thoroughly.

e. Fill etched letters and numbers with white crayon paint filler Type I (color No. 37778 per MIL-STD-595). Allow to dry thoroughly.

NOTE

Refer to applicable cleaning and refinishing, as required, specified in TB 43-0118.

4-7. Storage

a. Normal Storage. Store the AN/PRC-90 in a watertight container when not in use, and place the required number of active desiccant units (SB 38-100) inside the container. Seal the container with waterproof tape. When practical, store the AN/PRC-90 in a tightly closed cabinet and place desiccant inside the cabinet.

b. Storage in Maritime, High Altitude, or Rainy Areas. To prevent corrosion from salt air or saltwater spray, and from rust caused by condensation when the AN/PRC-90 is stored, wipe all exposed metal surfaces with a soft, clean, lint-free cloth moistened with lubricating oil, general purpose (NSN 9150-00-273-2389). To avoid condensation, transfer the equipment from cold to warmer temperatures by gradual stages. Package as described in subparagraph *a* and keep the equipment in low temperature storage. Check the condition of the AN/PRC-90 before and after each mission. To avoid corrosion damage remove battery during storage.

Section III. PREVENTIVE MAINTENANCE CHECKS AND SERVICES

4-8. Preflight Checks and Services

Preflight maintenance checks on the AN/PRC-90 are performed before flight and/or weekly. Table 4-1 lists preflight checks and services. The first column lists the item number. The second column lists the interval within which these checks are to be performed. The third column lists the item to be inspected. The fourth column lists procedures and checks.

4-9. Preventive Maintenance Checks and Services

Preventive Maintenance Checks and Services at AVUM level are made at 30 day intervals and after each period of operational use. Table 4-2 lists the preventive maintenance checks and services for AVUM level repair. Additionally, each AN/PRC-90 is to be sent to AVIM for Performance Test Procedures (para 4-12) at a maximum of 120 day intervals. Maintenance forms and records to be used and maintained on this equipment are specified in DA Pam 738-750 as contained in Maintenance Management Update.

Table 4-1. Preflight Preventive Maintenance Checks and Services

W - Before flight or weekly

ITEM NO.	INTERVAL W	ITEM TO BE INSPECTED	PROCEDURE
1	●	Exposed Metal Surfaces	Inspect metal surfaces for signs of rust and corrosion.
2	●	Wrist Strap	Inspect strap for mildew, fungus, dry rot, or insect damage
3	●	Battery cap and retainer	Check for proper removal and reassembly, broken retainer, and internal corrosion.
4	●	Antenna	Check condition for corrosion, cross threading, or bent connector parts. Check for antenna cover material breakdown.
5	●	Battery	Remove battery and check it and both battery contacts for signs of corrosion or alkaline leakage.

Table 4-1. Preflight Preventive Maintenance Checks and Services - Continued.

6	●	Headset, Electrical	Remove earphone from its case and check for signs of corrosion or insulation breakdown. Clean earpiece.
7	●	Case, Headset	Check case for loose snap, or material breakdown.
8	●	Controls	With battery removed, operate switches and check for chipped paint, faded identification symbols, or evidence of damage.
9	●	Hermetic Switch Seals	Check for cracks in the MCW and PUSH TO TALK switch covers.
10	●	Replacement	If radio appears unsatisfactory, replace the radio.

Table 4-2. Organizational Preventive Maintenance Checks and Services

A, M- After Operation and/or Monthly

ITEM NO.	INTERVAL A, M	ITEM TO BE INSPECTED	PROCEDURE
			CAUTION At organizational levels, the AN/PRC-90 is not opened for direct access to the circuits and the test sets are designed for proper tests without damage to the radio; however, if evidence of malfunctioning radios is noted, higher level maintenance is mandatory. Aircrew members depend on the AN/PRC-90 for survival.
1	•	Visual Inspection and Control Functions	Check exposed surfaces and general appearance of the AN/PRC-90 (battery terminals, battery, wrist strap, earphone, and antenna) for fungus, salt accumulation,

Table 4-2. Organizational Preventive Maintenance Checks and Services - Continued.

			and obvious signs of failure. Check physical operation of controls with battery removed (table 4-1).
2	●	Battery Test	Check Battery BA-1568/U, using Battery Test Set TS-2530/UR and Battery Test Adapter MX-8801/PRC-90 (para 4-13).
3	●	Radio Set AN/PRC-90	Check Radio Set AN/PRC-90 for proper operation in all modes, using Radio Test Set AN/PRM-32 (para 4-12).
4	●	Publications	Check DA Pam 310-1 to insure that all publications are current, complete, and serviceable.
5	●	Modifications	Check DA Pam 310-1 to determine if MWOs have been published. All URGENT MWOs require immediate and mandatory implementation. All NORMAL MWOs must be scheduled.
6	●	Records and Reports	Record and report results of checks and services in accordance with TM 38-750.

Section IV. TROUBLESHOOTING

4-10. Troubleshooting Procedures

a. Troubleshooting of the AN/PRC-90 is based on reports of malfunctions that may occur in flight and on the results obtained during preliminary attempts to correct the malfunction.

b. To troubleshoot the AN/PRC-90, check the list of malfunctions in table 4-3. Perform the tests, inspections, and corrective actions as indicated. If the corrective actions indicated do not correct the malfunction, refer the equipment to higher category of maintenance.

Table 4-3 Organizational Troubleshooting

MALFUNCTION TEST OR INSPECTION CORRECTIVE ACTION
1. AN/PRC-90 INOPERATIVE IN ALL MODES.
Step 1. Check for Battery BA-1568/U discharge or corrosion. Replace battery.
Step 2. Check for bent or corroded battery spring contacts. Clean and burnish spring contacts. (para 4-4 and 4-5)
Step 3. Check for circuit or control malfunction. Perform radio test set procedures to check for total malfunction.

MALFUNCTION
TEST OR INSPECTION
CORRECTIVE ACTION

CAUTION

Internal spring contact is set in epoxy and cannot be replaced at organizational levels. Do not open AN/PRC-90 case or remove operating controls or covers.

Refer to higher maintenance category.

2. **AN/PRC-90 OPERATES, BUT EARPHONE IS INOPERATIVE.**

   Step 1. Check for poor connections.
   Operate with an earphone known to be good.

   Step 2. Probable broken transducer, or internal open circuit.
   Refer to higher maintenance category.

3. **AN/PRC-90 TRANSMITS, BUT SPEAKER AND EARPHONE ARE INOPERATIVE.**

   Probable receiver or audio circuit malfunction.
   Refer to higher maintenance category.

4. **AN/PRC-90 RECEIVES, BUT ONE OR ALL TRANSMIT MODES INDICATE MALFUNCTION.**

   Inspect for probable transmitter or modulator amplifier malfunction.
   Refer to higher maintenance category.

5. **AN/PRC-90 OPERATES PROPERLY ON ONE FREQUENCY, BUT FAILS IN SECONDARY FREQUENCY.**

   Probable circuit malfunction.
   Refer to higher maintenance category.

MALFUNCTION	TEST OR INSPECTION	CORRECTIVE ACTION

CAUTION

Limit any transmission to less than 10 seconds to avoid alerting a false search mission.

6. **AN/PRC-90 OPERATES NORMALLY IN TEST SET, BUT DOES NOT OPERATE PROPERLY WITH ANTENNA CONNECTED.**

   Step 1. Broken antenna element or connector. Replace with antenna known to be good. Cleaning connecting surfaces.

   Step 2. Intermittent open circuit. Refer to higher maintenance category.

4-11. AVUM Maintenance Procedures (fig. 4-1)

a. Battery BA-1568/U

(1) Remove as follows:

(a) Unscrew (counterclockwise) watertight battery cover.

(b) Turn AN/PRC-90 upright and let battery drop out.

NOTE

If battery hangs up, remove with needle nose pliers and check all surfaces and contacts for leakage and/or corrosion. If contacts and container cannot be cleaned adequately, forward to higher maintenance category.

(2) Test Procedure:

(a) *General.* Battery Test Set TS-2530/UR with Battery Test Adapter MX-8801/PRC-90 or Battery Test Set TS-2530/UR are used to test Battery BA-1568/U. Refer to TM 11-6625-2631-14 for test set operating and maintenance instructions. Table 4-4 lists test set components. Figures 4-2 through 4-5 illustrate the test equipment and connecting parts.

NOTE

The TS-2530/UR and TS 2530A/UR contain data cards for other radios. Disregard inapplicable cards.

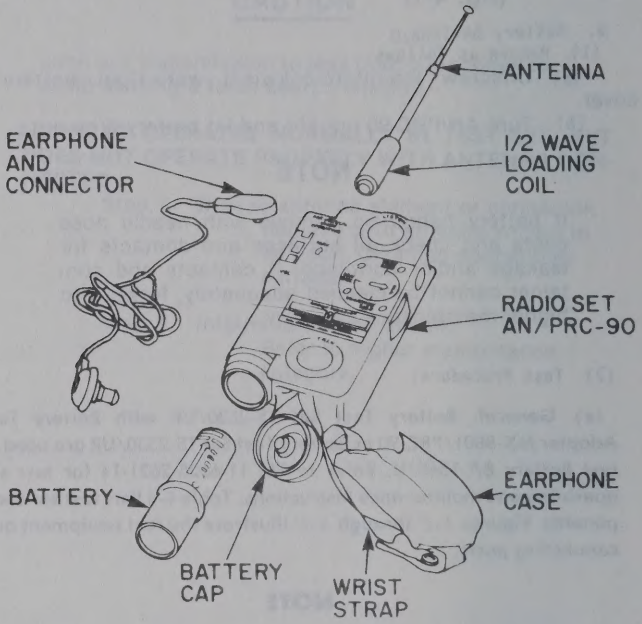


Figure 4-1. Radio Set AN/PRC-90, accessories removed.

Table 4-4. Items Comprising Battery Test Sets TS-2530/UR and TS-2530A/UR

Item	Qty	Dimensions (in.) Height	Depth	Width
Test Set, Battery TS-2530/UR consisting of:	1	5¼	5¼	4¼
TS-2530/UR instruction card	1			
PRC-90 data card (decal affixed to rear of instruction card)[a]				
Test Adapter, Battery MX-8801/PRC-90 (adapter cable length is 3 feet)[b]	1			

[a]PRC-90 data card is not to be used.
[b]Used with TS-2530/UR only.

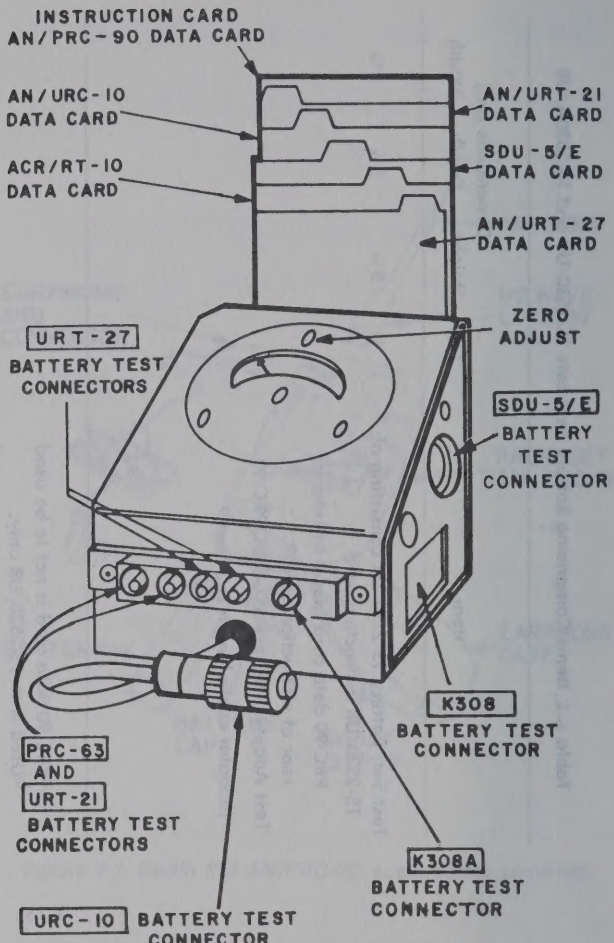


Figure 4-2. Battery Test Set TS-2530/UR

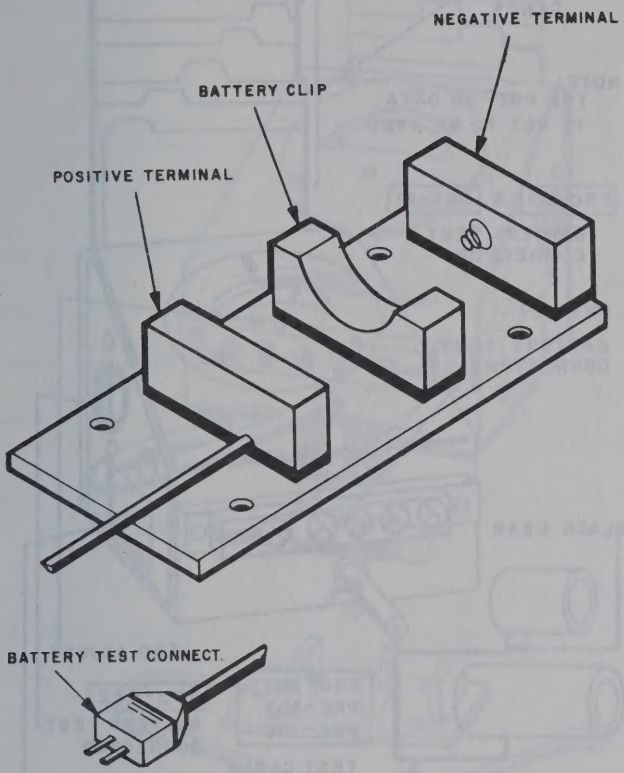


Figure 4-3. Battery Test Adapter MX-8801/PRC-90

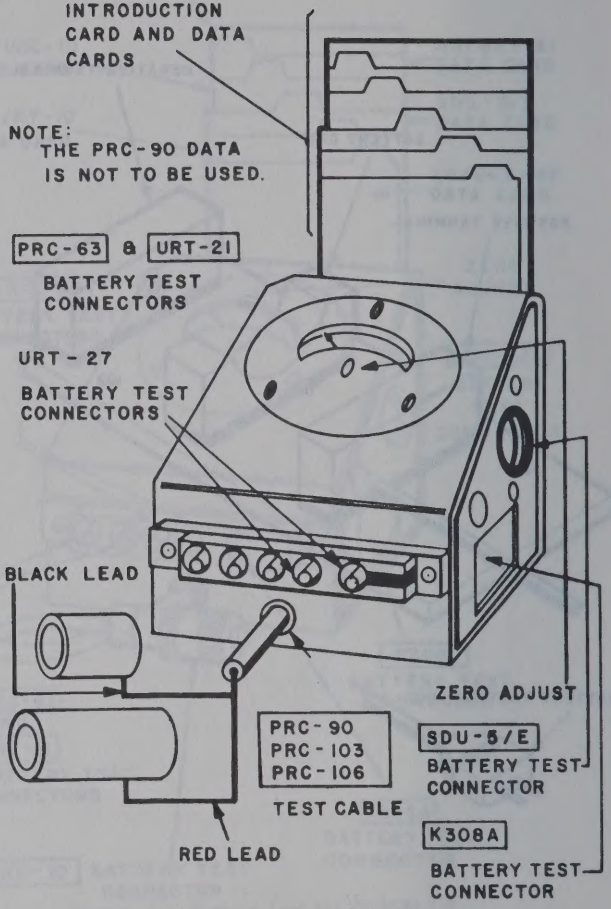


Figure 4-4. Battery Test Set TS-2530A/UR

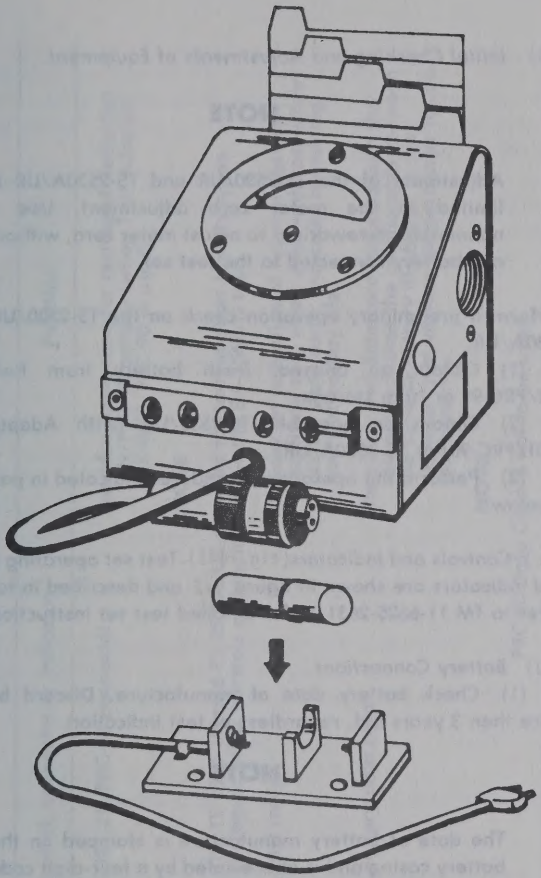


Figure 4-5. *Battery BA-1568/U(AN/PRC-90), test setup (TS-2530/UR only)*

(b) *Initial Checking and Adjustments of Equipment.*

NOTE

Adjustment of the TS-2530/UR and TS-2530A/UR is limited to the meter zero adjustment. Use a nonmetallic screwdriver to adjust meter zero, without any battery connected to the test set.

Perform a preliminary operation check on the TS-2530/UR or TS-2530A/UR.

(1) Obtain an unused, fresh battery from Radio Set AN/PRC-90 or from storage.

(2) Obtain an operable TS-2530/UR (with Adapter MX-8801/PRC-90) or TS-2530A/UR.

(3) Perform the operating procedures indicated in paragraph *h* below.

(c) *Controls and Indicators*(fig. 4-2).Test set operating controls and indicators are shown in figure 4-2 and described in table 4-5. Refer to TM 11-6625-2631-14 for detailed test set instructions.

(d) *Battery Connections.*

(1) Check battery date of manufacture. Discard batteries more than 3 years old, regardless of test indication.

NOTE

The date of battery manufacture is stamped on the battery casing and is abbreviated by a four-digit code number: the first two digits represent the month; the last two digits represent the year.

Table 4-5. Battery Test Set TS-2530/UR or TS-2530A/UR, Controls and Indicators (fig. 4-10 and 4-12)

Control, connector or indicator	Function
URT-21, PRC-63 connector	Provides connection for testing of Radio Set AN/PRC-90 battery (when Test Adapter MX-8801/PRC-90 is used).
	NOTE
The TS-2530/UR and TS-2530A/UR are used for testing other battery types. Disregard other controls and indicators for the BA-1568/U test.	
Test meter	Provides an indication of relative battery condition and, when used with respective battery data cards, indicates remaining hours of battery life.
Battery data cards	The plasticized data card included with the test set indicates the relationship between the state of battery discharge to life expectancy at various temperatures for all test batteries.
	NOTE
PRC-90 Data Card is not to be used.	

(2) For TS-2530/UR, connect the adapter leads to the battery test set connector block terminals designated PRC-63, with the male connector (red lead) to the + terminal; and the female lead (black lead) to the − terminal.

(3) Insert the battery in the adapter in accordance with the polarity markings. A typical test configuration for this battery is shown in figure 4-5.

(4) For TS-2530A/UR, connect the battery to the test cable.

(e) *Battery Test.* Perform the following steps.

CAUTION

Permanent damage may occur to the test set if battery polarity is not observed during test connections.

(1) After 5 minutes, observe the test meter reading. Meter readings below 0.74 indicate a weak BA-1568/U battery, and these batteries should be rejected.

(2) Reject battery if battery test indicates less than indication given in (1) above.

(3) Disconnect test adapter and battery (TS-2530/UR only).

(4) Disconnect test cable and battery (TS-2530A/UR only).

(5) Complete battery data card information.

(3) Replace as follows:

(a) Select a serviceable Battery BA-1568/U that has been checked and insert in the AN/PRC-90 battery enclosure.

CAUTION

Battery shape is such that it will only slip into the enclosure with proper polarity. Do not force the battery into place.

(b) Replace watertight cover (clockwise rotation). Tighten fingertight.

NOTE

If battery cover shows evidence of leaking, replace sealing washer in base of cap, or install new cap assembly. Refer to step b, below.

b. Replace wrist strap assembly as follows:

(1) Cut old strap assembly and remove all attaching parts. Dispose of worn parts and select new parts for reassembly.

(2) Attach battery cap, and battery cap retaining strap, and earphone case. Screw the battery cap onto the radio.

(3) Thread new strap through spaces between the radio case and the two cylindrical pins.

(4) Fold ends of wrist strap as shown in figure 4-2. Punch holes two places and apply a coat of varnish to prevent fraying. Allow to dry.

(5) Insert and swage grommets supplied with new wrist strap.

c. Antenna Assembly (fig. 4-7)

(1) Remove antenna as follows:

CAUTION

Do not attempt to loosen antenna by twisting; damaged antenna and seal may result.

Unscrew and remove antenna and sealing washer by hand.

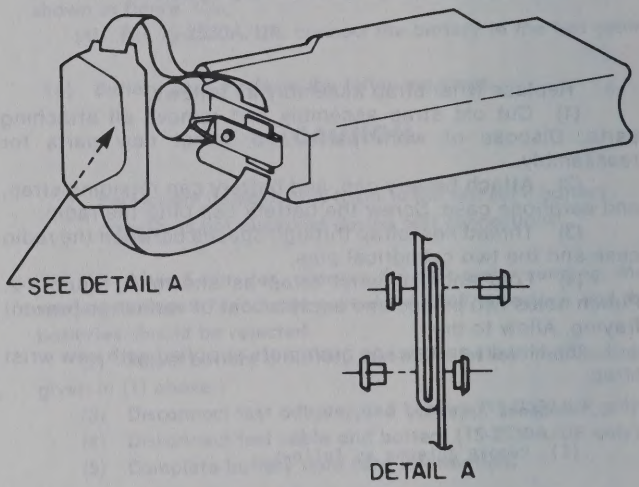


Figure 4-6. Wrist strap replacement detail.

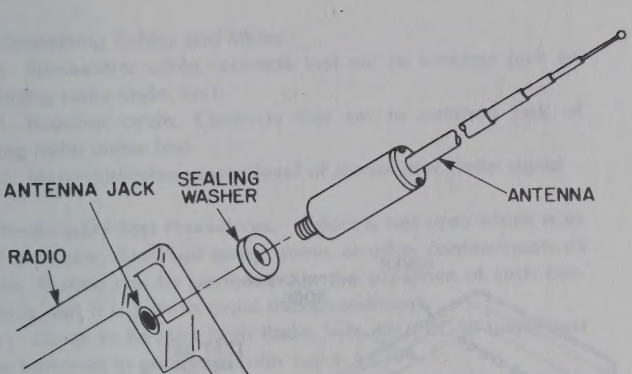


Figure 4-7. Antenna Removal from Radio Set AN/PRC-90.

CAUTION

Do not lose sealing washer.

(2) Replace antenna as follows:

(a) Place sealing washer over threads on antenna base.

(b) Screw antenna into antenna jack by hand (avoid cross threading).

d. Radio Test Procedure (fig. 4-8).

(1) General. Radio Test AN/PRM-32 is used to test Radio Set AN/PRC-90. The AN/PRM-32 has no control settings and serves only as a radio test link for testing AN/PRC-90 radios. It requires no special installation instructions, preliminary adjustments, external connections, or circuit alignments. Refer to TM 11-6625-2632-14 for a complete description of the AN/PRM-32.

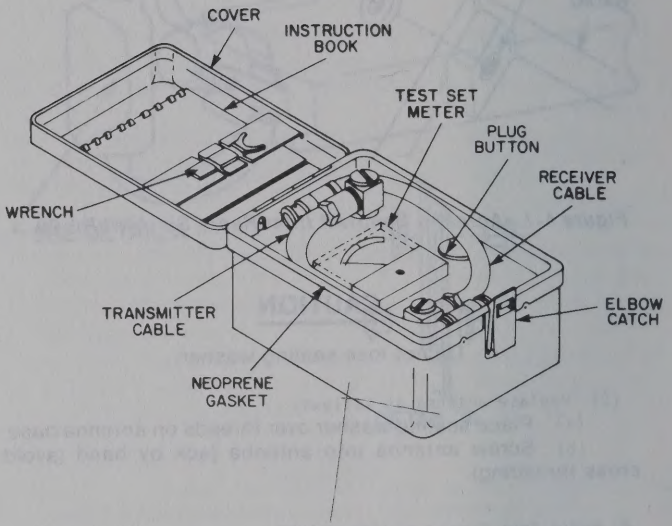


Figure 4-8. *Radio Test Set AN/PRM-32, Cover Open.*

(2) *Connecting Cables and Meter*

(a) Transmitter cable connects test set to antenna jack on transmitting radio under test.

(b) Receiver cable. Connects test set to antenna jack of receiving radio under test.

(c) Meter indicates power level of transmitter radio signal.

(3) *Preliminary Test Procedures.* Select a test area which is as free of moisture, dust, salt spray, snow, or other contaminants as possible. Testing can be performed in the presence of such contaminants, but it is best to avoid these conditions.

(a) Check to be sure both Radio Sets AN/PRC-90 under test contain batteries in good condition (para 4-11a).

(b) Remove antennas (para 4-11c) from both radio sets to be tested.

CAUTION

Do not lose sealing washer from antenna.

(c) Install a connector adapter (fig. 4-9) on each of the two radio antenna jacks. Avoid cross threading and seat connector adapters fingertight.

(d) Connect transmitter cable of test set to the connector adapter on one Radio Set AN/PRC-90 (transmitting radio), and connect receiver cable to the connector adapter on the other (receiving radio) (fig. 4-10)

e. *Beacon Monitor Check.*

(1) Set the function switch of the transmitting radio to the BCN 243.0 position.

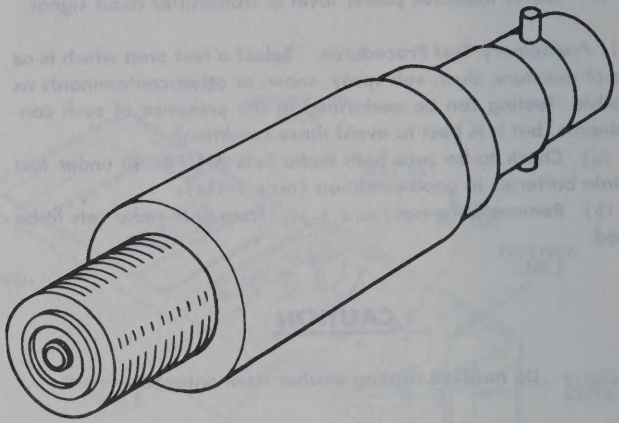


Figure 4-9. BNC Adapter MX-8802/PRC-90.

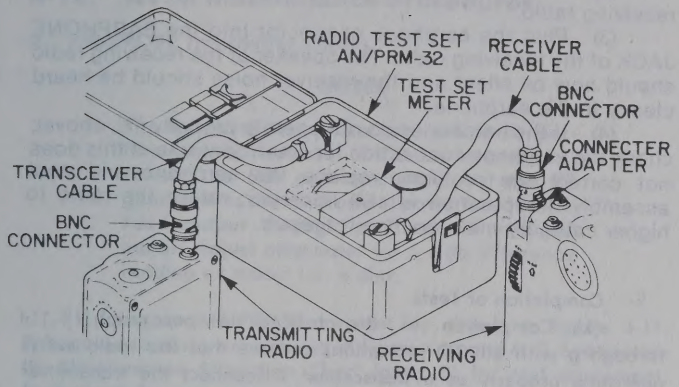


Figure 4-10. *Connection of test set radio under test.*

(2) A beacon tone should be barely audible from the speaker of the transmitting radio. If it is not, return the radio to higher category maintenance for repair.

f. Earphone Check.

(1) Using a transmitting radio known to be operating properly, set its function switch to the VOICE 282.8 position and its VOL control at minimum. Set the function switch of the receiving radio to the VOICE 282.8 position and its VOL control at MAX.

NOTE

To turn the knob of the function switch to the VOICE 282.8 position, press the button in the center of the knob while turning the knob in a counterclockwise direction.

(2) Observe the noise level from the speaker of the receiving radio.

(3) Plug the earphone connector into the EARPHONE JACK of the receiving radio. The speaker of the receiving radio should now be silent and the receiver noise should be heard clearly in the earphone.

(4) If the earphones do not operate properly ((3), above); check the earphone connection for clean contacts. If this does not correct the problem, replace the earphone and cord assembly. If operation is still improper, return the radio to higher category maintenance for repair.

g. *Completion of Tests.*

(1) Completion of the testing in paragraph 4-11d through g with all GO indications assures that the radio set is operating properly as a transceiver. Disconnect the transmitter cable and receiver cable and reconnect them with the radio sets reversed.

(2) Repeat the test procedures in paragraphs 4-11d, and f. If the testing is completed with all GO indications, both radio sets are operating properly as transmitters and as receivers.

(3) Disconnect the transmitter cable and receiver cable from the radio sets. Be sure the threads of the antennas and antenna jacks are free of moisture, dirt, or other contaminants. Install the antennas and antenna sealing washers. Avoid cross threading of the antennas.

(4) Disconnect the two connector adapters and place them in the test set. Stow the cables and close the cover.

NOTE

Test failures of several Radio Sets AN/PRC-90 in succession indicates a test equipment malfunction. Return Radio Test Set AN/PRM-32 to a higher category maintenance.

4-12. AVIM Maintenance Procedures

a. *AN/PRC-90 Transmitter Checks.*

NOTES

The following test procedures are to be performed at a maximum of 120 day intervals.
To set the 6db pad accurately, set the RF generator to a known output power i.e. 10dbm. Feed output through pad into RF millivolt meter. Adjust attenuator for a 6 db difference reading on meter i.e. 4 dbm.

(1) Set up AN/PRC-90 for test as shown in figure 4-11. Fabricated similators are shown in figure 4-12 and 4-13. See section III, Maintenance Allocation Chart (appx B) for test equipment. Equivalents for test equipment listed may be used.

(2) Place function switch on radio to 243.0 Voice/MCW.

(3) Adjust dc power supply to 12.0V $\pm$ 0.1V.

(4) Connect output of AN/PRC-90 to frequency counter through a 6db pad. Press PTT switch. Record transmitter frequency in table 4-6.

(5) Connect radio output to RF millivoltmeter through 6db pad. Press PTT switch. Record meter reading plus 6db in Power Out dbm UNMOD Column of table 4-6.

(6) Press MCW switch. Record meter reading plus 6db in Power Out dbm MCW Column of table 4-6.

(7) Rotate function switch on radio to BCN. Record reading plus 6db in Power Out dbm MOD Column of table 4-6.

(8) Adjust radio volume control to maximum. Read the sidetone output on oscilloscope. Record in table 4-6.

(9) Rotate function switch on radio to 282.8 Voice. Press PTT switch. Record reading plus 6db in Power Out dbm UNMOD Column of table 4-6.

(10) Press PTT switch and whistle into microphone. Record reading plus 6db In Power Out dbm MOD Column of table 4-6.

(11) Connect radio output to frequency counter. Press PTT switch. Record transmitter output frequency in Frequency MHz UNMOD Column of table 4-6.

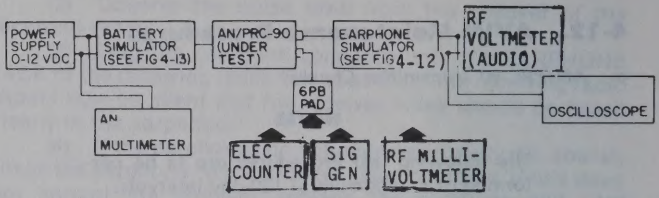


Figure 4-11. Test Set-up for RECV/XMR AN/PRC-90

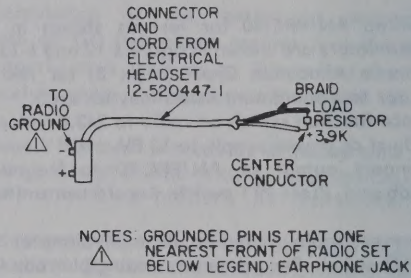


Figure 4-12. Earphone Simulator

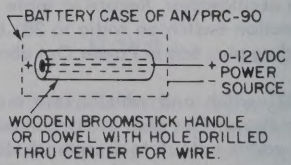


Figure 4-13. Battery Simulator

TABLE 4-6. TRANSMITTER TESTS

SWITCH FUNCTION	TEST	@12 VOLTS	LIMITS MIN.	@10 VOLTS	LIMITS MIN.
243.0	FREQUENCY MHz UNMOD		± 12.15 kHz		SAME
	POWER OUT dbm UNMOD		20.0 dbm		18.0 dbm
	POWER OUT dbm MCW		27.0 dbm		25.0 dbm
BCN	POWER OUT dbm MOD		27.0 dbm		25.0 dbm
	SIDE VAC TONE		0.2Vpp MIN 1.0V ppMAX		SAME

Table 4-6 Transmitter Tests - Continued.

282.8	FREQUENCY mHz UNMOD		± 14.14 kHz		SAME
	POWER OUT dbm UNMOD		18.0 dbm		16 dbm
	POWER OUT dbm MOD		25.5 dbm		23 dbm

(12) Readjust dc input power supply to 10.0V ± 0.1V. Perform steps 2 through 11. Record results in table 4-6.

b. Receiver Checks AN/PRC-90.

(1) Adjust dc power supply to 12.0V ± 0.1V.

(2) Set function switch on radio to 243.0 Voice/MCW. Adjust output of signal generator to 243.0 MHz ±5kHz. Use frequency counter to observe frequency. Adjust output of signal generator to 10 microvolts. Adjust to 1000 cycle and 30% modulation. Feed output through 6db to AN/PRC-90.

(3) Adjust the radio volume control to a point less than maximum, to avoid overloading the output audio amplifier. (An audio output voltage of 2.5 volts rms or 10 dbm prevents this overload.) From the RF voltmeter record reading in Signal and Noise Column of table 4-7.

(4) Remove modulation. Record noise level from RF voltmeter in Noise Column of table 4-7.

(5) Subtract the noise reading from the signal and noise reading and record the difference.

(6) Change AN/PRC-90 function switch to 282.8 Voice.

(7) Adjust output of signal generator to 282.8 MHz using the frequency counter for observation. Adjust signal generator for 10 microvolts, 1000 cycle and 30% modulation. Feed through 6db to radio. Adjust volume control of radio to 2.5V rms.

(8) Remove modulation. Record noise level from RF voltmeter in Noise Column of table 4-7.

(9) Subtract the Noise reading from the Signal and Noise reading and record the difference.

(10) Set volume control of radio for maximum. Reset signal generator to 1 kHz and 30% modulation. Read audio output on oscilloscope for a 3.0V pp minimum.

(11) Change AN/PRC-90 function switch to 243.0 Voice/MCW. Set signal generator to 243.0 MHz. Read audio output on oscilloscope for 3.0V pp minimum.

(12) Readjust dc power supply to 10V ± 0.1V. Repeat steps 2 through 11.

Table 4-7 Receiver Tests

FUNCTION		SIGNAL & NOISE	NOISE	DIFFERENCE	MINIMUM	MIN AUDIO OUTPUT (MAX VOL)
SWITCH	VOLTS					
243.0	12.0 V				6 db	3.0 vpp Min
243.0	10.0 V				6 db	3.0 vpp Min
282.8	12.0 V				6 db	3.0 vpp Min
282.8	10.0 V				6 db	3.0 vpp Min

Table 4-8 Correspondence Table for Decibels, Volts, and Watts (50Ω Load)

Decibels	Volts	Watts
+40dbw	709V	10,000W
+39dbw	633V	7,940W
+38dbw	563V	6,320W
+37dbw	501V	5,000W
+36dbw	447V	3,980W
+35dbw	399V	3,160W
+34dbw	355V	2,510W
+33dbw	317V	2,000W
+32dbw	282V	1,590W
+31dbw	252V	1,260W
+30dbw	224V	1,000W
+29dbw	200V	794W
+28dbw	178V	632W
+27dbw	159V	500W
+26dbw	141V	398W
+25dbw	126V	316W
+24dbw	112V	251W
+23dbw	100V	200W
+22dbw	89.1V	159W
+21dbw	79.5V	126W
+20dbw	70.9V	100W
+19dbw	63.3V	79.4W
+18dbw	56.3V	63.2W
+17dbw	50.1V	50.0W
+16dbw	44.7V	39.8W
+15dbw	39.9V	31.6W
+14dbw	35.5V	25.1W
+13dbw	31.7V	20.0W
+12dbw	28.2V	15.9W
+11dbw	25.2V	12.6W
+10dbw	22.4V	10.0W

Table 4-8 Correspondence Table for Decibels, Volts, and Watts (50Ω Load) - Continued.

Decibels	Volts	Watts
+9dbw	20.0V	7.94W
+8dbw	17.8V	6.32W
+7dbw	15.9V	5.00W
+6dbw	14.1V	3.98W
+5dbw	12.6V	3.16W
+4dbw	11.2V	2.51W
+3dbw	10.0V	2.00W
+2dbw	8.91V	1.59W
+1dbw	7.95V	1.26W
OdBw = +30dbw	7.09V	1.00W = 1000mW
+29dbm	6.33V	794mW
+28dbm	5.63V	632mW
+27dbm	5.01V	500mW
+26dbm	4.47V	398m W
+25dbm	3.99V	316mW
+24dbm	3.55V	251mW
+23dbm	3.17V	200mW
+22dbm	2.82V	159mW
+21dbm	2.52V	126mW
+20dbm	2.24V	100mW
+19dbm	2.00V	79.4mW
+18dbm	1.78V	63.2mW
+17dbm	1.59V	50.0mW
+16dbm	1.41V	39.8mW
+15dbm	1.26V	31.6mW
+14dbm	1.12V	25.1mW
+13dbm	1.00V = 1000mV	20.0mW
+12dbm	891mV	15.9mW
+11dbm	795mV	12.6mW
+10dbm	709mV	10.0mW

APPENDIX A
REFERENCES

Following is a list of references available to AVIM/AVUM maintenance personnel of Radio Set AN/PRC-90:

DA Pam 310-1	Consolidated Index of Army Publications and Blank Forms.
DA Pam 738-750	The Army Maintenance Management System (TAMMS).
SB 38-100	Preservation, Packaging, Packing and Marking Materials, Supplies, and Equipment Used by the Army.
SC 5180-91-CL-R13	Sets, Kits, and Outfits Components List: Tool Kit, Electronic Equipment TK-101/G.
TB 43-180	Calibration and Repair Requirements for the Maintenance of Army Materiel.
TB 43-0118	Field Instructions for Painting and Preserving Electronics Command Equipment Including Camouflage Pattern Painting of Electrical Equipment Shelters.
TM 11-6625-2631-14	Operator's Organizational, Direct Support, and General Support Maintenance Manual: Including Repair Parts and Special Tools List for Test Set, Battery TS-2530/UR (NSN 6625-00-933-6612).
TM 11-6625-2632-14	Operator's, Organizational, Direct Support, and General Support Maintenance Manual Including Repair Parts and Special Tools List for Radio Test Set AN/PRM-32 (NSN 6625-00-808-3399).
TM 55-1680-317-23&P	Organizational and Direct Support Maintenance Manual Including Repair Parts and Special Tools List for Army Aircraft Survival Kit.
TM 740-90-1	Administrative Storage of Equipment.
TM 750-244-2	Procedures for Destruction of Electronic Materiel to Prevent Enemy Use (Electronics Command).

APPENDIX B
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

B-1. MAINTENANCE ALLOCATION CHART.

a. This Maintenance Allocation Chart (MAC) assigns maintenance functions in accordance with the Three Levels of Maintenance Concept for Army Aviation. These maintenance levels (categories) Aviation Unit Maintenance (AVUM), Aviation Intermediate Maintenance (AVIM), and Depot Maintenance are depicted on the MAC as:

AVUM, which corresponds to an O Code in the Repair Parts and Special Tools List (RPSTL)

AVIM, which corresponds to an F Code in the Repair Parts and Special Tools List (RPSTL)

DEPOT, which corresponds to a D Code in the Repair Parts and Special Tools List (RPSTL)

b. The maintenance to be performed below depot and the field is described as follows:

(1) Aviation Unit Maintenance (AVUM) activities will be staffed and equipped to perform high frequency "On-Aircraft" maintenance tasks required to retain or return aircraft systems to a serviceable condition. The maintenance capability of the AVUM will be governed by the Maintenance Allocation Chart (MAC) and limited by the amount and complexity of ground support equipment (GSE), facilities required, authorized manning strength, and critical skills available.

(2) Aviation Intermediate Maintenance (AVIM) provides mobile, responsive "One-Stop" maintenance support. (Maintenance functions which are not conducive to sustaining air mobility will be assigned to depot maintenance.) AVIM may

perform all maintenance functions authorized to be done at AVUM. Repair of equipment for return to user will emphasize support or operational readiness requirements. Authorized maintenance includes replacement and repair of modules/components and end items which can be accomplished efficiently with available skills, tools, and equipment. AVIM establishes the Direct Exchange (DX) program for AVUM units by repairing selected items for return to stock when such repairs cannot be accomplished at the AVUM level. The AVIM level inspects, troubleshoots, performs diagnostic tests, repairs, adjusts, calibrates, and alines aircraft system modules/components. Unserviceable repairable modules/components and end items which are beyond the capability of AVIM to repair will be evacuated to Depot Maintenance.

B-2. USE OF THE MAINTENANCE ALLOCATION CHART (Sect. II).

NOTE

Nomenclatures used throughout the MAC are approved item names. Those terms/nomenclatures expressed in parentheses are generic in nature and are not to be considered as official terminology.

a. The Maintenance Allocation Chart assigns maintenance functions to the lowest category of maintenance based on past experience and the following considerations:

(1) Skills available.
(2) Work time required.
(3) Tools and test equipment required and/or available.

b. Only the lowest category of maintenance authorized to perform a maintenance function is indicated. If the lowest maintenance category cannot perform all tasks of any single maintenance function (e.g., test, repair), then the higher

maintenance level(s) that can accomplish additional tasks will also be indicated.

c. A maintenance function assigned to a maintenance category will automatically be authorized to be performed at any higher maintenance category.

d. A maintenance function that cannot be performed at the assigned category of maintenance for any reason may be evacuated to the next higher maintenance category.

B-3. MAINTENANCE FUNCTIONS.

Maintenance functions will be limited as follows:

a. Inspect
b. Test
c. Service
d. Repair

B-4. GROUP NUMBER AND COMPONENT/ASSEMBLY (Columns 1 and 2, Respectively).

a. Group Number (Column 1). Column 1 lists group numbers, the purpose of which is to identify components, assemblies, subassemblies, and modules with the next higher assembly.

b. Component/Assembly (Column 2). Column 2 contains the noun names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

B-5. MAINTENANCE FUNCTION (Column 3).

Column 3 lists the functions to be performed on the items listed in column 2.

B-6. MAINTENANCE CATEGORIES AND WORK TIMES (Column 4).

The maintenance categories (levels) AVUM, AVIM, and DEPOT are listed on the Maintenance Allocation Chart with individual columns that include the work times for maintenance functions at each maintenance level. Work time presentations such as "0.1" indicate the average time it requires a

maintenance level to perform a specified maintenance function. If a work item has not been established, the columnar presentation shall indicate " " Maintenance levels higher than the level of maintenance indicated are authorized to perform the indicated function.

B-7. TOOLS AND TEST EQUIPMENT (Column 5 and Section III).

Common tool sets (not individual tools), special tools, test and support equipment required to perform maintenance functions are listed alphabetically in Section III with a reference number to permit cross-referencing to column 5 in the MAC. In addition, the maintenance category authorized to use the device is listed along with the item National Stock Number (NSN) and, if applicable, the tool number to aid in identifying the tool/device.

B-8. REMARKS (Column 6 and Section IV).

Remarks (identified by an alphabetical code in column 6) and other notes (identified by a number in parentheses in the applicable column) are listed in Section IV to provide a ready reference to the definition of the remark/note.

SECTION II MAINTENANCE ALLOCATION CHART FOR RADIO SET AN/PRC-90

(1) GROUP NUMBER	(2) COMPONENT ASSEMBLY	(3) MAINTENANCE FUNCTION	(4) MAINTENANCE CATEGORY			(5) TOOLS AND EQUIPMENT	(6) REMARK
			AVUM	AVIM	DEPOT		
00	Radio Set Group AN/PRC-90	Inspect	0.1				
		Test	0.1			1-3,16	
		Test		1.0		1-16	A
		Service	0.1				
		Repair	0.2				B
		Repair			2.0		C

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS FOR RADIO SET AN/PRC-90

TOOL OR TEST EQUIP. REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/ NATO STOCK NO.	TOOL NO.
1	AVUM, AVIM	RADIO TEST SET AN/PRM-32A	6625-01-013-9900	
		OR		
		RADIO TEST SET AN/PRM-32	6625-00-803-3399	
2	AVUM, AVIM	BATTERY TESTER TS-2530/UR	6625-00-933-6112	
		OR		
		BATTERY TESTER TS-2630A/UR	6625-00-238-0223	
3	AVUM, AVIM	BATTERY TEST ADAPTER MX-8801/PRC-90	6625-00-480-6315	
4	AVIM	VOLTMETER, ELECTRONIC AN/URM-1468	6625-00-973-3986	
5	AVIM	GENERATOR, SIGNAL AN/USM-44C	6625-00-138-7773	
6	AVIM	COUNTER, ELECTRONIC DIGITAL AN/USM-469	6625-01-061-8928	
7	AVIM	MULTIMETER AN/USM-451	6625-00-060-6804	
8	AVIM	MULTIMETER ME-268/U	6625-00-646-9409	
9	AVIM	OSCILLOSCOPE AN/USM-281C	6625-00-106-9622	
10	AVIM	POWER SOURCE (0-12VDC)	6130-00-985-8137	

SECTION III. TOOL AND TEST EQUIPMENT REQUIREMENTS
FOR
RADIO SET AN/PRC-90. Continued.

TOOL OR TEST EQUIP. REF CODE	MAINTENANCE CATEGORY	NOMENCLATURE	NATIONAL/ NATO STOCK NO.	TOOL NO.
11	AVIM	6P5 ATTENUATOR CN-1285/U	5985-00-454-6925	
		OR CN-1174/U	5985-00-491-4305	
12	AVIM	ANTENNA ADAPTER (FROM AN/PRM-32A)		
13	AVIM	EARPHONE SIMULATOR (SEE FIGURE 2)		
14	AVIM	BATTERY SIMULATOR (SEE FIGURE 3)		
15	AVIM	TOOL KIT, ELECTRONIC EQUIPMENT TK-100/G	5120-00-625-0079	
16	AVUM,AVIM	TOOL KIT, ELECTRONIC EQUIPMENT TK-101/G	5120-00-064-5178	

SECTION IV
REMARKS FOR MAINTENANCE ALLOCATION CHART
FOR RADIO SET AN/PRC-90

REFERENCE CODE	REMARKS
A	Test is to be performed at 90-120 day intervals to verify condition and performance of Radio Set AN/PRC-90, using test procedures and specified test equipment. Test will also be performed on any radio considered defective (other than battery, antenna, or other external component damage) to pinpoint defect prior to return to depot.
B	AVUM repair is limited to replacement of external parts such as battery and antenna.
C	Defective Radio Sets should be forwarded to: Commander Transportation Officer Sacramento Army Depot Sacramento, CA 95801 M/F: Depot Stock Condition Code F Repair and overhaul shall be accomplished by the Air Force under DMISA.

APPENDIX C
ORGANIZATIONAL MAINTENANCE REPAIR PARTS AND SPECIAL TOOLS LIST

Section I. INTRODUCTION

C-1. Scope

This appendix lists repair parts and special tools required for the performance of organizational maintenance of the AN/PRC-90.

C-2. General

This Repair Parts and Special Tools List is divided into the following sections:

a. Section II - Repair Parts List. A list of repair parts authorized for use in the performance of maintenance. The list also includes parts which must be removed for replacement of the authorized parts. Parts lists are composed of functional groups in ascending numerical sequence, with the parts in each group listed in figure and item number sequence.

b. Section III - Special Tools List. A list of special tools, TMDE, and support equipment authorized for the performance of maintenance at the organizational level.

c. Section IV - National Stock Number and Part Number Index. Not applicable.

C-3. Explanation of Columns

a. Illustration. This column is divided as follows:

(1) *Figure number.* Indicates the figure number of the illustration in which the item is shown.

(2) *Item number.* The number used to identify each item called out in the illustration.

b. Source, Maintenance, and Recoverability Codes (SMR).

(1) *Source code.* Source codes are assigned to support items to indicate the manner of acquiring support items for

maintenance, repair, or overhaul of end items. Source codes are entered in the first and second positions of the Uniform SMR Code format as follows:

Code *Definition*

PA - Item procured and stocked for anticipated or known usage.

PE - Support equipment procured and stocked for initial issue or outfitting to specified maintenance repair activities.

XD - A support item that is not stocked. When required, item will be procured through normal supply channels.

NOTE

Cannibalization or salvage may be used as a source of supply for any items source coded above except those coded XA, XD, and aircraft support items as restricted by AR 750-1

(1) *Maintenance code.* Maintenance codes are assigned to indicate the levels of maintenance authorized to USE and REPAIR support items. The maintenance codes are entered in the third and fourth positions of the Uniform SMR Code format as follows:

(a) The maintenance code entered in the third position will indicate the lowest maintenance level authorized to remove, replace, and use the support item. The maintenance code entered in the third position will indicate the following level of maintenance:

Code *Application/explanation*

O - Support item is removed, replaced, used at the organizational level.

(b) The maintenance code entered in the fourth position indicates whether the item is to be repaired and identifies the lowest maintenance level with the capability to perform complete repair (i.e., all authorized maintenance func-

tions) This position will contain one of the following maintenance codes.

Code	*Application/explanation*
H	The lowest maintenance level capable of complete repair of the support item is the general support level.
Z	Nonreparable. No repair is authorized.

(3) *Recoverability Code.* Recoverability codes are assigned to support items to indicate the disposition action on unserviceable items. The recoverability code is entered in the fifth position of the Uniform SMR Code format as follows:

Recoverability codes	*Definition*
Z	Nonreparable item. When unserviceable, condemn and dispose at the level indicated in position 3.
L	Reparable item. Repair, condemnation, and disposal not authorized below depot/specialized repair activity level

c. National Stock Number. Indicates the National stock number assigned to the item and will be used for requisitioning purposes.

d. Part Number. Indicates the primary number used by the manufacturer (individual, company, firm, corporation, or Government activity) which controls the design and characteristics of the item by means of its engineering drawings, specifications standards, and inspection requirements to identify an item or range of items.

NOTE

When a stock numbered item is requisitioned, the repair part received may have a different part number than the part being repaired.

e. Federal Supply Code for Manufacturer (FSCM). The

FSCM is a 5-digit numeric code listed in SB 708-42 which is used to identify the manufacturer, distributor, or Government agency, etc.

f. Description. Indicates the Federal item name and, if required, a minimum description to identify the item.

g. Unit of Measure (U/M). Indicates the standard of the basic quantity of the listed item as used in performing the actual maintenance function. This measure is expressed by a two character alphabetical abbreviation (e.g., ea, in, pr, etc.). When the unit of measure differs from the unit of issue, the lowest unit of issue that will satisfy the required units of measure will be requisitioned.

h. Quantity Incorporated in Unit. Indicates the quantity of the item used in the breakout shown on the illustration figure, which is prepared for a functional group, subfunctional group, or an assembly.

C-4. How to Locate Repair Parts

Not applicable.

C-5. Abbreviations

Not applicable.

Section II. Repair Parts List

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
			GROUP HEADER RADIO SET AN/PRC-90					
1	3	PAOZZ	5820-00-422-3081	05524-803-1	04655	Wrist Strap	EA	1
1	1	PAOZZ	5820-00-371-6806	03-000-01-001	52340	Antenna	EA	1
1	6	PAOZZ	5965-00-121-7569	12-520447	31487	Headset, Electrical	EA	1
1	2	PAOZZ	5965-00-497-1130	506630-1	04655	Case, Headset	EA	1
1	4	PAOZZ	5820-00-041-1352	89-524-802-1	04655	Battery Cap and Retainer	EA	1
1	5	PAOZZ	6135-00-838-0706	303654A	90303	Battery	EA	1
		PAOZZ	5330-00-928-7209	NAS1598-6R	80205	Washer, Sealing	EA	1
		PAOZZ	5360-00-151-5903	77-52478-1	04655	Spring, Helical	EA	1

Section III. Special Tools List

(1) ILLUSTRATION (a) FIG NO.	(1) ILLUSTRATION (b) ITEM NO.	(2) SMR CODE	(3) NATIONAL STOCK NUMBER	(4) PART NUMBER	(5) FSCM	(6) DESCRIPTION	(7) U/M	(8) QTY INC IN UNIT
1	1	PEOH.L	6625-00-803-3399	01-524-930-2	04655	Special Tools Radio Test Set AN/PRM-32	EA	1
1	2	PEOH L	6625-00-933-6112	BT2	18560	Battery Test Set TS-2530/UR	EA	1
1	3	PEOZZ	6625-00-480-6315	89-524-848-1	04655	Battery Test Adapter MX-8801/ PRC-90	EA	1
1	4	XDOZZ		T1-04-0001	04655	Antenna Wrench, Spanner	EA	1

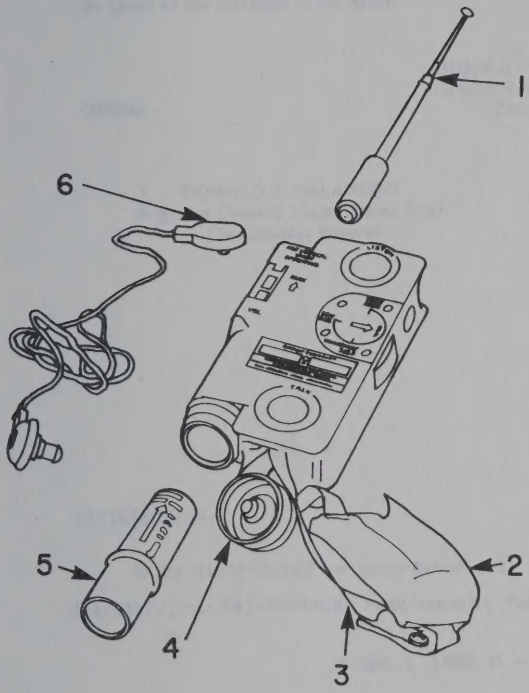
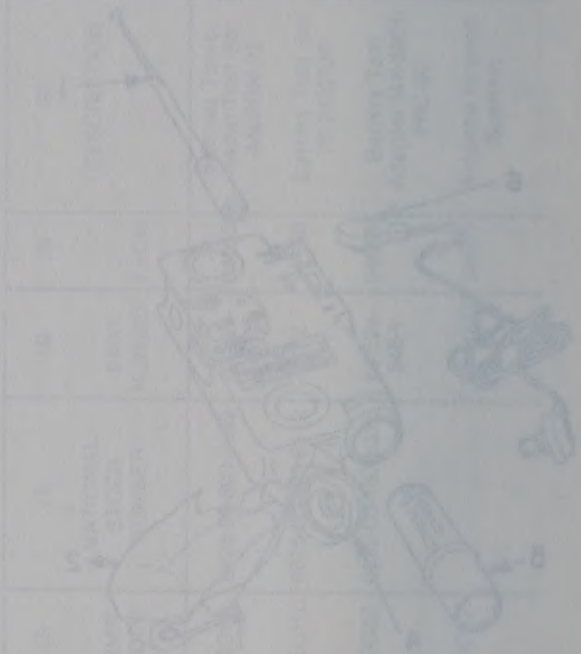


Figure 1. Radio Set AN/PRC-90.



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